

# 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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6.186. Mobile Communication - T-INFO-101322 .....	407
6.187. Model Driven Software Development - T-INFO-101278 .....	408
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6.189. Modeling and OR-Software: Advanced Topics - T-WIWI-106200 .....	411
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6.201. Operations Research in Supply Chain Management - T-WIWI-102715 .....	426
6.202. Optimization Models and Applications - T-WIWI-110162 .....	428
6.203. Optimization under Uncertainty - T-WIWI-106545 .....	429
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6.206. Parallel Computer Systems and Parallel Programming - T-INFO-101345 .....	432
6.207. Parametric Optimization - T-WIWI-102855 .....	433
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6.209. Pattern Recognition - T-INFO-101362 .....	435
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6.212. Portfolio and Asset Liability Management - T-WIWI-103128 .....	440
6.213. Practical Course Computer Vision for Human-Computer Interaction - T-INFO-105943 .....	441
6.214. Practical Course Protocol Engineering - T-INFO-104386 .....	442
6.215. Practical Course: Analysis of Complex Data Sets - T-INFO-105796 .....	443
6.216. Practical Course: Database Systems - T-INFO-103201 .....	444
6.217. Practical Course: Geometric Modeling - T-INFO-103207 .....	445
6.218. Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data - T-INFO-106219 .....	446
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6.220. Practical Course: Web Applications and Service-Oriented Architectures (II) - T-INFO-103121 .....	448
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6.228. Predictive Mechanism and Market Design - T-WIWI-102862 .....	459
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6.258. Selected Topics in Cryptography - T-INFO-101373 .....	493
6.259. Selling IT-Solutions Professionally - T-INFO-101977 .....	494
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6.264. Seminar in Informatics B (Master) - T-WIWI-103480 .....	508
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6.266. Seminar in Statistics A (Master) - T-WIWI-103483 .....	514
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6.279. Sociotechnical Information Systems Development - T-WIWI-109249 .....	529
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6.282. Software Quality Management - T-WIWI-102895 .....	532
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6.292. Supplement Enterprise Information Systems - T-WIWI-110346 .....	545
6.293. Supply Chain Management in the Automotive Industry - T-WIWI-102828 .....	546
6.294. Supply Chain Management with Advanced Planning Systems - T-WIWI-102763 .....	547
6.295. Symmetric Encryption - T-INFO-101390 .....	549
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6.299. Technical Conditions Met - T-WIWI-106623 .....	554
6.300. Technologies for Innovation Management - T-WIWI-102854 .....	555
6.301. Technology Assessment - T-WIWI-102858 .....	556
6.302. Telecommunication and Internet Economics - T-WIWI-102713 .....	557
6.303. Telecommunications Law - T-INFO-101309 .....	558
6.304. Telematics - T-INFO-101338 .....	559
6.305. Theory of Endogenous Growth - T-WIWI-102785 .....	560
6.306. Topics in Experimental Economics - T-WIWI-102863 .....	562
6.307. Trademark and Unfair Competition Law - T-INFO-101313 .....	563
6.308. Transport Economics - T-WIWI-100007 .....	564
6.309. Ubiquitous Computing - T-INFO-101326 .....	566
6.310. Valuation - T-WIWI-102621 .....	567
6.311. Wearable Robotic Technologies - T-INFO-106557 .....	568
6.312. Web Applications and Service-Oriented Architectures (II) - T-INFO-101271 .....	569

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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

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✉ bachelor@wirtschaftsinformatik.kit.edu

For modules and courses with WIWI-Id



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

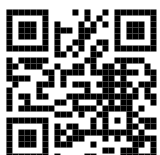
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## 2 About this handbook

### 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 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 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.

### 2.1.8 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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[master@wirtschaftsinformatik.kit.edu](mailto:master@wirtschaftsinformatik.kit.edu)

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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				Compulsory		Electives		Electives			
1	27	INFO 8 CP	INFO 8 CP			BUS 10 CP	OR 5 CP	BUS 9 CP		Law 9 CP			
2	30,5												
3	32,5			INFO 8 CP					BUS/ECON/ OR/STAT 9 CP		Law 9 CP	2 Seminars 3 CP + 3 CP	
4	30				INFO 9 CP								
120													

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

## 4 Field of study structure

Mandatory	
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

Mandatory		
M-WIWI-101656	Module Master Thesis	30 CR



## 4.2 Informatics

Credits  
33

Election block: Informatik (at least 33 credits)		
M-WIWI-101455	Web Data Management	9 CR
M-WIWI-101456	Intelligent Systems and Services	9 CR
M-WIWI-101457	Semantic Technologies	9 CR
M-WIWI-101458	Ubiquitous Computing	9 CR
M-WIWI-101477	Development of Business Information Systems	9 CR
M-INFO-100729	Human Computer Interaction	6 CR
M-INFO-100744	Formal Systems II: Application	5 CR
M-INFO-100799	Formal Systems	6 CR
M-INFO-100801	Telematics	6 CR
M-INFO-100806	Language Technology and Compiler	8 CR
M-INFO-100826	Automated Visual Inspection and Image Processing	6 CR
M-INFO-100841	Formal Systems II: Theory	5 CR
M-INFO-100893	Robotics I - Introduction to Robotics	6 CR
M-INFO-101173	Algorithms II	6 CR
M-INFO-101178	Communication and Database Systems	8 CR
M-INFO-101197	Computer Security	9 CR
M-INFO-101198	Advanced Topics in Cryptography	9 CR
M-INFO-101199	Advanced Algorithms: Design and Analysis	9 CR
M-INFO-101200	Advanced Algorithms: Engineering and Applications	9 CR
M-INFO-101201	Software Systems	9 CR
M-INFO-101202	Software Methods	9 CR
M-INFO-101203	Wireless Networking	8 CR
M-INFO-101204	Networking Labs	9 CR
M-INFO-101205	Future Networking	8 CR
M-INFO-101206	Networking	8 CR
M-INFO-101207	Networking Security - Theory and Praxis	9 CR
M-INFO-101208	Innovative Concepts of Data and Information Management	8 CR
M-INFO-101210	Dynamic IT-Infrastructures	9 CR
M-INFO-100728	Context Sensitive Systems	5 CR
M-INFO-101239	Machine Vision	9 CR
M-INFO-101251	Autonomous Robotics	9 CR
M-INFO-100031	Algorithms for Routing	5 CR
M-INFO-100768	Big Data Analytics	5 CR
M-INFO-100794	Randomized Algorithms	5 CR
M-INFO-100795	Algorithm Engineering	5 CR
M-INFO-100796	Parallel Algorithms	5 CR
M-INFO-100797	Algorithms in Cellular Automata	5 CR
M-INFO-101237	Algorithmic Methods for Hard Optimization Problems	5 CR
M-INFO-101256	Theory and Practice of Data Warehousing and Mining	9 CR
M-INFO-102072	Laboratory Course Algorithm Engineering	6 CR
M-INFO-102094	Algorithms for Visualization of Graphs	5 CR
M-WIWI-102827	Service Computing	9 CR
M-INFO-100819	Cognitive Systems	6 CR
M-INFO-102978	Digital Circuits Design	6 CR
M-INFO-103138	Lab Course: Natural Language Processing and Software Engineering	5 CR
M-INFO-103235	Practical Course: Smart Data Analytics	6 CR

M-INFO-103302	Lab: Graph Visualization in Practice	5 CR
M-WIWI-103356	Machine Learning	9 CR
M-INFO-102400	Algorithmic Methods for Network Analysis	5 CR
M-INFO-100789	Ubiquitous Computing	5 CR
M-INFO-104061	Microservice-Based Web Applications	8 CR
M-WIWI-104403	Critical Digital Infrastructures	9 CR
M-WIWI-104520	Human Factors in Security and Privacy	9 CR
M-INFO-104460	Deep Learning and Neural Networks	6 CR
M-INFO-100730	Geometric Optimization	3 CR
M-INFO-100736	Introduction to Video Analysis	3 CR
M-INFO-100755	Image Data Compression	3 CR
M-INFO-100769	Datamanagement in the Cloud	5 CR
M-INFO-100780	Deployment of Database Systems	5 CR
M-INFO-100782	Network Security: Architectures and Protocols	4 CR
M-INFO-100785	Mobile Communication	4 CR
M-INFO-100812	Meshes and Point Clouds	3 CR
M-INFO-100825	Pattern Recognition	3 CR
M-INFO-100828	Models of Parallel Processing	5 CR
M-INFO-101575	Computational Complexity Theory, with a View Towards Cryptography	6 CR
M-INFO-101662	Practical Course: Database Systems	4 CR
M-INFO-101663	Practical Course: Analyzing Big Data	4 CR
M-INFO-101666	Practical Course: Geometric Modeling	3 CR
M-INFO-101864	Subdivision Algorithms	5 CR
M-INFO-102110	Computational Geometry	5 CR
M-INFO-102773	Big Data Analytics 2	3 CR
M-INFO-102807	Practical Course: Analysis of Complex Data Sets	4 CR
M-INFO-103128	Practical Course: Implementation and Evaluation of Advanced Data Mining Approaches for Semi-Structured Data	4 CR
M-INFO-103294	Wearable Robotic Technologies	4 CR
M-INFO-104045	Data Privacy: From Anonymization to Access Control	3 CR
M-INFO-104119	Secure Multiparty Computation	3 CR
M-INFO-104447	Automated Planning and Scheduling	5 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
<b>Election block: Wahlmodule WIWI (9 credits)</b>		
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-101490	Marketing Management	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-101487	Sales 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: Wahlmodule BWL (9 credits)</b>		
M-WIWI-101470	Data Science: Advanced CRM	9 CR
M-WIWI-101409	Electronic Markets	9 CR
M-WIWI-101446	Market Engineering	9 CR
M-WIWI-101410	Business & Service Engineering	9 CR
M-WIWI-101448	Service Management	9 CR
M-WIWI-101506	Service Analytics	9 CR
M-WIWI-101503	Service Design Thinking	9 CR
M-WIWI-101482	Finance 1	9 CR
M-WIWI-101483	Finance 2	9 CR
M-WIWI-101471	Industrial Production II	9 CR
M-WIWI-101412	Industrial Production III	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-101507	Innovation Management	9 CR
M-WIWI-101490	Marketing Management	9 CR
M-WIWI-101487	Sales Management	9 CR
M-WIWI-101647	Data Science: Evidence-based Marketing	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-102754	Service Economics and Management	9 CR
M-WIWI-102806	Service Innovation, Design & Engineering	9 CR
M-WIWI-102808	Digital Service Systems in Industry	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-103247	Intelligent Risk and Investment Advisory	9 CR
M-WIWI-103261	Disruptive FinTech Innovations	9 CR
M-WIWI-103119	Advanced Topics in Strategy and Management	9 CR
M-WIWI-103720	eEnergy: Markets, Services and Systems	9 CR
M-WIWI-104068	Information Systems in Organizations	9 CR
M-WIWI-104080	Designing Interactive Information Systems	9 CR
M-WIWI-101510	Cross-Functional Management Accounting	9 CR
M-WIWI-101480	Finance 3	9 CR
M-WIWI-105036	FinTech Innovations	9 CR
M-WIWI-105032	Data Science for Finance	9 CR

**4.4 Law****Credits**  
18

Election block: Recht (18 credits)		
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: Forschungsfach Wahl (2 aus 3 Modulen) (2 items)		
M-INFO-101218	Seminar Module Law	3 CR
M-INFO-102822	Seminar Module Informatics	3 CR
M-WIWI-102736	Seminar Module Economic Sciences	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	Algorithms in Cellular Automata	5 CR	Worsch
T-INFO-101331	Randomized Algorithms	5 CR	Worsch
T-INFO-101333	Parallel Algorithms	5 CR	Sanders
T-INFO-103334	Algorithmic Methods for Hard Optimization Problems	5 CR	Wagner
T-INFO-104390	Algorithms for Visualization of Graphs	5 CR	Wagner
T-INFO-104374	Laboratory Course Algorithm Engineering	6 CR	Sanders, Wagner
T-INFO-101332	Algorithm Engineering	5 CR	Sanders, Wagner
T-INFO-100002	Algorithms for Routing	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**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
1

Election block: Fortgeschrittene Themen der Kryptographie (at least 1 item as well as at least 9 credits)			
T-INFO-101373	<a href="#">Selected Topics in Cryptography</a>	3 CR	Müller-Quade
T-INFO-101360	<a href="#">Signals and Codes</a>	3 CR	Müller-Quade
T-INFO-101260	<a href="#">Asymmetric Encryption Schemes</a>	3 CR	Müller-Quade
T-INFO-101390	<a href="#">Symmetric Encryption</a>	3 CR	Müller-Quade
T-INFO-101259	<a href="#">Provable Security in Cryptography</a>	3 CR	Hofheinz
T-INFO-101279	<a href="#">Cryptographic Voting Schemes</a>	3 CR	Müller-Quade
T-INFO-101280	<a href="#">Digital Signatures</a>	3 CR	Hofheinz

**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 (Wahlmodule WIWI)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Language**  
German

**Level**  
4

**Version**  
4

Mandatory			
T-WIWI-102740	Public Management	4,5 CR	Wigger
Election block: Ergänzungsangebot (between 4,5 and 5 credits)			
T-WIWI-108880	Blockchains & Cryptofinance	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	Public Revenues	4,5 CR	Wigger

**Competence Certificate**

The assessment is carried out as partial 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	1

Election block: Wahlpflichtangebot (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.

This module will be offered for the first time in the winter term 2017/18.

## 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**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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	Algorithmic Methods for Hard Optimization Problems	5 CR	Wagner

**Competence Goal**

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

**Content**

There are many practical problems that cannot be solved optimally - some not at all and some not in a 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:** Prof. Dr. Henning Meyerhenke

**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	Meyerhenke

**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**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-100002	<a href="#">Algorithms for Routing</a>	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**  
5

**Recurrence**  
Irregular

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-104390	<a href="#">Algorithms for Visualization of Graphs</a>	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**  
6

**Recurrence**  
Each winter term

**Duration**  
1 semester

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-102020	<a href="#">Algorithms II</a>	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**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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 (Wahlmodule WIWI)

Credits	Language	Level	Version
9	German	4	2

Mandatory			
T-WIWI-103123	<a href="#">Advanced Statistics</a>	4,5 CR	Grothe
Election block: Ergänzungsangebot (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 (Wahlmodule WIWI)

Credits	Language	Level	Version
9	German/English	4	3

Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102861	<a href="#">Advanced Game Theory</a>	4,5 CR	Ehrhart, Puppe, Reiß
T-WIWI-106623	<a href="#">Technical Conditions Met</a>	0 CR	
Election block: Ergänzungsangebot (between 1 and 2 items as well as at least 4,5 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* [2520525] 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. For further information see German version.

## M

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

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

**Credits**  
5

**Language**  
English

**Level**  
4

**Version**  
1

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

## M

## 5.16 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**  
6

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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

## M

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

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann

**Organisation:** KIT Department of Informatics

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

**Credits**  
9

**Recurrence**  
Once

**Duration**  
2 semester

**Level**  
4

**Version**  
3

Election block: Autonomie Robotik (at least 1 item as well as at least 9 credits)			
T-INFO-101351	<a href="#">Biologically Inspired Robot</a>	3 CR	Dillmann
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

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

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

**Credits**  
5

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101305	<a href="#">Big Data Analytics</a>	5 CR	Böhm

## M

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

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

**Credits**  
3

**Recurrence**  
Irregular

**Language**  
German

**Level**  
4

**Version**  
1

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



## M

**5.20 Module: Business & Service Engineering [M-WIWI-101410]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)  
 Economics and Management (Wahlmodule BWL)

Credits	Language	Level	Version
9	German/English	4	3

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-106201	Digital Transformation of Organizations	4,5 CR	Mädche
T-WIWI-102639	Business Models in the Internet: Planning and Implementation	4,5 CR	Weinhardt
T-WIWI-102848	Personalization and Services	4,5 CR	Sonnenbichler
T-WIWI-102847	Recommender Systems	4,5 CR	Geyer-Schulz
T-WIWI-102799	Practical Seminar Service Innovation	4,5 CR	Satzger
T-WIWI-102641	Service Innovation	4,5 CR	Satzger
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt

**Competence Certificate**

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

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

**Competence Goal**

The 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****5.21 Module: Cognitive Systems [M-INFO-100819]**

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann  
Prof. Dr. Alexander Waibel

**Organisation:** KIT Department of Informatics

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

**Credits**  
6

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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

## M

**5.22 Module: Collective Decision Making [M-WIWI-101504]**

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Language**  
English

**Level**  
4

**Version**  
4

Election block: Wahlpflichtangebot ()			
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****5.23 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****5.24 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**  
Each term

**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

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

**Responsible:** 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-104429	<a href="#">Computational Geometry</a>	5 CR	Wagner

## M

## 5.26 Module: Computer Security [M-INFO-101197]

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

**Credits**  
9

**Recurrence**  
Once

**Duration**  
1 semester

**Level**  
4

**Version**  
2

Election block: Computersicherheit (at least 1 item as well as at least 9 credits)			
T-INFO-101371	Security	6 CR	Hofheinz, Müller-Quade
T-INFO-101360	Signals and Codes	3 CR	Müller-Quade
T-INFO-101390	Symmetric Encryption	3 CR	Müller-Quade
T-INFO-101279	Cryptographic Voting Schemes	3 CR	Müller-Quade
T-INFO-101260	Asymmetric Encryption Schemes	3 CR	Müller-Quade

**Competence Goal**

The student

- knows and understands the basic commonly used algorithms, their design, correctness and efficiency analysis, implementation, documentation and application,
- can handle new algorithmic problems, using this understanding,
- can apply the mathematical approaches learned in the basic computer science and mathematics courses to solve problems. Main topics are here formal correctness arguments and a mathematical analysis of efficiency.
- deals with a restricted problem in the field of computer security within the seminar,
- analyzes and discusses the problems associated to a distinct discipline in the lectures and in the final seminar paper,
- discusses, presents and defends subject-specific arguments within a given task,
- organizes the preparation of the final papers largely independent.

**Prerequisites**

None

**Content**

Theoretical and practical aspects of computer security

- Development of safety goals and classification of threats
- Presentation and comparison of different formal access control models
- Formal description of authentication systems, presentation and comparison of different authentication methods (passwords, biometrics, challenge-response protocols)
- 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
- Block ciphers, hash functions, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (eg, Diffie-Hellman)
- Presentation of combinations of cryptographic modules using currently used protocols such as Secure Shell (SSH) and Transport Layer Security (TLS)

**Workload**

approx. 270h

## 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**  
5

**Language**  
German

**Level**  
4

**Version**  
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: Wahlpflichtangebot (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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German/English	4	8

Mandatory			
T-WIWI-102885	<a href="#">Advanced Management Accounting</a>	4,5 CR	Wouters
Election block: Ergänzungsangebot (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**  
3

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-108377	<a href="#">Data Privacy: From Anonymization to Access Control</a>	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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	4

Election block: Wahlpflichtangebot (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-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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German/English	4	6

Election block: Wahlpflichtangebot ()			
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-106207	<a href="#">Practical Seminar: Data-Driven Information Systems</a>	4,5 CR	Mädche, Setzer, Weinhardt
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), 1-3 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German/English	4	4

Election block: Wahlpflichtangebot (at least 9 credits)			
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
T-WIWI-109863	<a href="#">Business Data Analytics: Application and Tools</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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits  
9Recurrence  
OnceLanguage  
GermanLevel  
4Version  
5

Election block: Wahlpflichtangebot (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 rst 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**  
5

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101306	<a href="#">Datamanagement in the Cloud</a>	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**  
6

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-109124	<a href="#">Deep Learning and Neural Networks</a>	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**  
5

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101317	<a href="#">Deployment of Database Systems</a>	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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German/English	4	1

Mandatory			
T-WIWI-108461	<a href="#">Interactive Information Systems</a>	4,5 CR	Mädche, Morana
Election block: Ergänzungsangebot (at most 4,5 credits)			
T-WIWI-105773	<a href="#">Digital Service Design</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.

**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: Wahlpflichtangebot (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: Ergänzungsangebot (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**  
6

**Recurrence**  
Each winter term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-103469	<a href="#">Digital Circuits Design</a>	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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102872	<a href="#">Challenges in Supply Chain Management</a>	4,5 CR	Mohr
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-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
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.





## 5.43 Module: Disruptive FinTech Innovations [M-WIWI-103261]

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	English	4	1

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-106193	<a href="#">Engineering FinTech Solutions</a>	9 CR	Ulrich
T-WIWI-106496	<a href="#">Computational FinTech with Python and C++</a>	1,5 CR	Ulrich
T-WIWI-106495	<a href="#">Automated Financial Advisory</a>	3 CR	Ulrich

### Competence Certificate

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

### 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

None.

### Content

Within the scope of the lecture "Engineering FinTech Solutions" students get the opportunity to solve a partial problem from a larger FinTech problem independently and at the same time with close mentoring - by employees 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.

In the course "Computational FinTech with Python and C++" students are given individually tailored programming tasks at the beginning of the semester.

The contents of the seminar "Automated Financial Advisory" will be discussed with the students at the beginning of the semester.

### Recommendation

None

### Annotation

See respective lecture

### Workload

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

## M

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

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Level**  
4

**Version**  
2

Election block: Dynamische IT-Infrastrukturen (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

## 5.45 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 (Wahlmodule WIWI)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
3

Mandatory			
T-WIWI-103125	<a href="#">Applied Econometrics</a>	4,5 CR	Schienle
Election block: Ergänzungsangebot (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-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

**5.46 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 (Wahlmodule WIWI)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
2

Election block: Wahlpflichtangebot (between 9 and 10 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-103124	<a href="#">Multivariate Statistical Methods</a>	4,5 CR	Grothe
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-103128	<a href="#">Portfolio and Asset Liability Management</a>	4,5 CR	Safarian
T-WIWI-103065	<a href="#">Statistical Modeling of Generalized Regression Models</a>	4,5 CR	Heller
T-WIWI-103129	<a href="#">Stochastic Calculus and Finance</a>	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

**5.47 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 (Wahlmodule WIWI)

Credits	Language	Level	Version
9	German/English	4	4

Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	Mitusch
T-WIWI-102861	Advanced Game Theory	4,5 CR	Ehrhart, Puppe, Reiß
Election block: Ergänzungsangebot (1 item)			
T-WIWI-102647	Asset Pricing	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-102622	Corporate Financial Policy	4,5 CR	Ruckes
T-WIWI-109050	Corporate Risk Management	4,5 CR	Ruckes
T-WIWI-102623	Financial Intermediation	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

**5.48 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	1

Election block: Wahlpflichtangebot (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

**5.49 Module: Electronic Markets [M-WIWI-101409]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	4

Election block: Wahlpflichtangebot (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

**5.50 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits  
9Recurrence  
Each termDuration  
1 semesterLanguage  
German/EnglishLevel  
4Version  
5

Mandatory			
T-WIWI-107043	<a href="#">Liberalised Power Markets</a>	3 CR	Fichtner
Election block: Ergänzungsangebot (at least 6 credits)			
T-WIWI-102691	<a href="#">Energy Trade and Risk Management</a>	4 CR	Cremer, Keles
T-WIWI-102607	<a href="#">Energy Policy</a>	3,5 CR	Wietschel
T-WIWI-107501	<a href="#">Energy Market Engineering</a>	4,5 CR	Weinhardt
T-WIWI-108016	<a href="#">Simulation Game in Energy Economics</a>	3 CR	Genoese
T-WIWI-107446	<a href="#">Quantitative Methods in Energy Economics</a>	3 CR	Keles, Plötz
T-WIWI-102712	<a href="#">Regulation Theory and Practice</a>	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. Additional courses might be accredited upon request.

**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. For further information see German version.

## M

**5.51 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

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

Election block: Wahlpflichtangebot (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

**5.52 Module: Entrepreneurship (EnTechnon) [M-WIWI-101488]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits  
9Recurrence  
Each termDuration  
2 semesterLanguage  
German/EnglishLevel  
4Version  
8**Election notes**

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

Election block: Pflichtbestandteil (1 item)			
T-WIWI-102864	<a href="#">Entrepreneurship</a>	3 CR	Terzidis
Election block: Wahlpflichtangebot (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: Ergänzungsangebot (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

**5.53 Module: Environmental Economics [M-WIWI-101468]**

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)

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

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102650	Energy and Environment	4,5 CR	Karl
T-WIWI-100007	Transport Economics	4,5 CR	Mitusch, Szimba
T-WIWI-102615	Environmental Economics and Sustainability	5 CR	Walz
T-WIWI-102616	Environmental and Resource Policy	4 CR	Walz
T-INFO-101348	Environmental Law	3 CR	Bäcker

**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****5.54 Module: Experimental Economics [M-WIWI-101505]**

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

Credits	Language	Level	Version
9	German	4	5

Election block: Wahlpflichtangebot (2 items)			
T-WIWI-102614	Experimental Economics	4,5 CR	Weinhardt
T-WIWI-105781	Incentives in Organizations	4,5 CR	Nieken
T-WIWI-102862	Predictive Mechanism and Market Design	4,5 CR	Reiß
T-WIWI-102863	Topics in Experimental Economics	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

## 5.55 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

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

Election block: Wahlpflichtangebot (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

## 5.56 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	5

Election block: Wahlpflichtangebot (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-109941	<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

## 5.57 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	4	5

Election block: Wahlpflichtangebot (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-109941	<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

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

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	English	4	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

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

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

**Credits**  
6

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101336	<a href="#">Formal Systems</a>	6 CR	Beckert

## M

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

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

**Credits**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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

## M

## 5.61 Module: Formal Systems II: Theory [M-INFO-100841]

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

**Credits**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101378	<a href="#">Formal Systems II: Theory</a>	5 CR	Beckert

## M

**5.62 Module: Future Networking [M-INFO-101205]**

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

**Credits**  
8

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
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

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

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

**Credits**  
3

**Recurrence**  
Irregular

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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

## M

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

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Language**  
German

**Level**  
4

**Version**  
5

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

## M

**5.65 Module: Growth and Agglomeration [M-WIWI-101496]**

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
3

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109194	Dynamic Macroeconomics	4,5 CR	Brumm
T-WIWI-102785	Theory of Endogenous Growth	4,5 CR	Ott
T-WIWI-103107	Spatial Economics	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

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

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

**Credits**  
6

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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

**5.67 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

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

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

**Credits**  
3

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
English

**Level**  
4

**Version**  
1

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

## M

**5.69 Module: Industrial Production II [M-WIWI-101471]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)  
 Economics and Management (Wahlmodule BWL)

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: Ergänzungsangebot aus dem Modul Industrielle Produktion III (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	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: Ergänzungsangebot (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

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

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)  
 Economics and Management (Wahlmodule BWL)

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

Mandatory			
T-WIWI-102632	Production and Logistics Management	5,5 CR	Schultmann
Election block: Ergänzungsangebot aus dem Modul Industrielle Produktion II (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
Election block: Ergänzungsangebot (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	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

### 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

**5.71 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	Once	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

**5.72 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	2

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-105777	<a href="#">Business Intelligence Systems</a>	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-106201	<a href="#">Digital Transformation of Organizations</a>	4,5 CR	Mädche
T-WIWI-108461	<a href="#">Interactive Information Systems</a>	4,5 CR	Mädche, Morana
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 informations 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

**5.73 Module: Innovation and Growth [M-WIWI-101478]**

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

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

Election block: Wahlpflichtangebot (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="#">Innovationtheory 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

**5.74 Module: Innovation Economics [M-WIWI-101514]**

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

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

Election block: Wahlpflichtangebot (between 9 and 10 credits)			
T-WIWI-102840	Innovationtheory and -Policy	4,5 CR	Ott
T-WIWI-102906	Methods in Economic Dynamics	1,5 CR	Ott
T-WIWI-109864	Product and Innovation Management	3 CR	Klarmann
T-WIWI-102789	Seminar in Economic Policy	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****5.75 Module: Innovation Management [M-WIWI-101507]**

**Responsible:** Prof. Dr. Marion Weissenberger-Eibl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)  
 Economics and Management (Wahlmodule BWL)

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

Mandatory			
T-WIWI-102893	Innovation Management: Concepts, Strategies and Methods	3 CR	Weissenberger-Eibl
Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
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: Ergänzungsangebot (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-102866	Design Thinking	3 CR	Terzidis
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

**5.76 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**  
8

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
2

Election block: Innovative Konzepte des Daten- und Informationsmanagements (at least 1 item as well as at least 8 credits)			
T-INFO-101305	Big Data Analytics	5 CR	Böhm
T-INFO-101306	Datamanagement in the Cloud	5 CR	Böhm
T-INFO-101317	Deployment of Database Systems	5 CR	Böhm
T-INFO-101975	Consulting in Practice	1,5 CR	Böhm
T-INFO-101976	Project Management in Practice	1,5 CR	Böhm
T-INFO-101977	Selling IT-Solutions Professionally	1,5 CR	Böhm
T-INFO-101257	Mechanisms and Applications of Workflow Systems	5 CR	Mülle
T-INFO-105742	Big Data Analytics 2	3 CR	Böhm
T-INFO-108377	Data Privacy: From Anonymization to Access Control	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****5.77 Module: Intellectual Property Law [M-INFO-101215]**

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German

**Level**  
4

**Version**  
3

Election block: Recht des Geistigen Eigentums (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

**5.78 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 (Wahlmodule BWL)

Credits	Language	Level	Version
9	English	4	3

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

**5.79 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: Wahlpflichtangebot (between 9 and 10 credits)			
T-WIWI-102661	Database Systems and XML	4,5 CR	Oberweis
T-WIWI-106423	Information Service Engineering	4,5 CR	Sack
T-WIWI-110548	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-102666	Knowledge Discovery	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 learning 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

## 5.80 Module: Introduction to Video Analysis [M-INFO-100736]

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

**Credits**  
3

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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

**M****5.81 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](#)

Credits	Language	Level	Version
5	German	4	1

Mandatory			
T-INFO-106239	<a href="#">Lab Course: Natural Language Processing and Software Engineering</a>	5 CR	Tichy

## M

## 5.82 Module: Lab: Graph Visualization in Practice [M-INFO-103302]

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

**Credits**  
5

**Language**  
German

**Level**  
4

**Version**  
1

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

## M

## 5.83 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](#)

**Credits**  
6

**Recurrence**  
Each term

**Language**  
German/English

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-104374	<a href="#">Laboratory Course Algorithm Engineering</a>	6 CR	Sanders, Wagner

## M

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

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

**Credits**  
8

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101343	<a href="#">Language Technology and Compiler</a>	8 CR	Snelting



## M

**5.85 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: Wahlpflichtangebot (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

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

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
4

Election block: MVW Pflichtblock (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: MVW - Wahlpflicht (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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits  
9Recurrence  
Each termDuration  
1 semesterLanguage  
German/EnglishLevel  
4Version  
5

Mandatory			
T-WIWI-102640	<a href="#">Market Engineering: Information in Institutions</a>	4,5 CR	Weinhardt
Election block: Ergänzungsangebot (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-109941	<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 Management [M-WIWI-101490]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	1 semester	German/English	4	11

Election block: Wahlpflichtangebot (at least 1 item)			
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
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-106137	<a href="#">Country Manager Simulation</a>	1,5 CR	Feurer
T-WIWI-102835	<a href="#">Marketing Strategy Business Game</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. Therefore the students can choose between the following marketing courses:

- Product and Innovation Management
- Market Research – this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing
- Marketing Strategy Business Game
- Country Manager Simulation

**Annotation**

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

**Workload**

The total workload for this module is approximately 270 hours.



## 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 (Wahlmodule WIWI)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
6

Election block: Wahlpflichtangebot (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: Ergänzungsangebot (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](#)

**Credits**  
3

**Recurrence**  
Each term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101349	<a href="#">Meshes and Point Clouds</a>	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 (Wahlmodule WIWI)

**Credits**  
9

**Language**  
German/English

**Level**  
4

**Version**  
3

Election block: Wahlpflichtangebot (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**  
8

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101271	<a href="#">Web Applications and Service-Oriented Architectures (II)</a>	4 CR	Abeck
T-INFO-103121	<a href="#">Practical Course: Web Applications and Service-Oriented Architectures (II)</a>	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**  
4

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

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



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

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

**Credits**  
5

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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.



## 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 (Wahlmodule WIWI)

Credits	Language	Level	Version
9	German/English	4	2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch
T-WIWI-100007	Transport Economics	4,5 CR	Mitusch, Szimba
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	Mitusch
T-WIWI-102712	Regulation Theory and Practice	4,5 CR	Mitusch
T-WIWI-102713	Telecommunication and Internet Economics	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**  
4

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
2

Election block: Networking Labs (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-101319	Network Security: Architectures and Protocols	4 CR	Zitterbart
T-INFO-106061	Access Control Systems: Foundations and Practice	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.



## 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**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
1

Election block: Netzsicherheit - Theorie und 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.



## 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 (Wahlmodule WIWI)

Credits	Language	Level	Version
9	German	4	6

Election block: Wahlpflichtangebot (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: Ergänzungsangebot (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-106549	<a href="#">Large-scale Optimization</a>	4,5 CR	Rebennack
T-WIWI-110162	<a href="#">Optimization Models and Applications</a>	4,5 CR	Sudermann-Merx
T-WIWI-102704	<a href="#">Facility Location and Strategic Supply Chain Management</a>	4,5 CR	Nickel
T-WIWI-102714	<a href="#">Tactical and Operational Supply Chain Management</a>	4,5 CR	Nickel

### Competence Certificate

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

The assessment procedures are described for each course of the module 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* [WI1OR] 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**  
5

**Recurrence**  
Each winter term

**Duration**  
1 semester

**Level**  
4

**Version**  
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**  
5

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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**  
3

**Recurrence**  
Each summer term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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**  
4

**Recurrence**  
Each term

**Language**  
English

**Level**  
4

**Version**  
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**  
4

**Recurrence**  
Each summer term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-103202	<a href="#">Analyzing Big Data - Laboratory Course</a>	4 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**  
4

**Recurrence**  
Each winter term

**Language**  
German

**Level**  
4

**Version**  
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**  
3

**Recurrence**  
Each winter term

**Language**  
German

**Level**  
4

**Version**  
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](#)

**Credits**  
 4

**Language**  
 English

**Level**  
 4

**Version**  
 1

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**  
6

**Recurrence**  
Each summer term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-106426	<a href="#">Practical Course: Smart Data Analytics</a>	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	Language	Level	Version
9	German	4	3

Election block: Recht der Wirtschaftsunternehmen (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:** Prof. Dr. Matthias Bäcker  
**Organisation:** KIT Department of Informatics  
**Part of:** Law

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German

**Level**  
4

**Version**  
3

Election block: Öffentliches Wirtschaftsrecht (at least 1 item as well as at least 9 credits)			
T-INFO-101309	Telecommunications Law	3 CR	Marsch
T-INFO-101303	Data Protection Law	3 CR	Marsch
T-INFO-101311	Public Media Law	3 CR	Dreier
T-INFO-101312	European and International Law	3 CR	Brühann
T-INFO-101348	Environmental Law	3 CR	Bäcker

**Competence Certificate**  
 see course description.





## 5.114 Module: Randomized Algorithms [M-INFO-100794]

**Responsible:** Thomas Worsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [Informatics](#)

**Credits**  
5

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
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**  
6

**Recurrence**  
Each winter term

**Language**  
German

**Level**  
4

**Version**  
3

Mandatory			
T-INFO-108014	<a href="#">Robotics I - Introduction to Robotics</a>	6 CR	Asfour

**M****5.116 Module: Sales Management [M-WIWI-101487]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

**Credits**  
9

**Duration**  
1 semester

**Language**  
English

**Level**  
4

**Version**  
8

**Election notes**

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

Mandatory			
T-WIWI-102890	<a href="#">Sales Management and Retailing</a>	3 CR	Klarmann
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-106137	<a href="#">Country Manager Simulation</a>	1,5 CR	Feurer
T-WIWI-106981	<a href="#">Digital Marketing and Sales in B2B</a>	1,5 CR	Konhäuser
T-WIWI-110389	<a href="#">Business Planning for Founders - EUCOR</a>	3 CR	Terzidis
T-WIWI-110381	<a href="#">International Selling - EUCOR</a>	3 CR	Casenave , Klarmann
T-WIWI-102891	<a href="#">Price Negotiation and Sales Presentations</a>	1,5 CR	Klarmann, Schröder
Election block: Ergänzungsangebot (at most 2 items)			
T-WIWI-107720	<a href="#">Market Research</a>	4,5 CR	Klarmann
T-WIWI-102883	<a href="#">Pricing</a>	4,5 CR	Feurer

**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

**Competence Goal**

Students

- have an advanced knowledge about sales management (design and structure of sales systems, relationship with sales partners and important customers)
- have a fundamental understanding of price management (in particular consumer behavior of pricing, pricing strategy, price determination)
- are able to handle particularities and challenges in sales management
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- are able to implement their extensive sales and pricing knowledge in a practical context
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the sales department

**Prerequisites**

The course "Sales Management and Retailing" is compulsory.

**Content**

The aim of the module is to deepen the sales management knowledge of the students. Theoretical approaches often have a combined view on marketing and sales, whereas in practical surroundings the sales department is completely separated from the marketing tasks. Given this fact, we concentrate on pure sales management topics and address different facets of the sales management.

**Annotation**

For further information please contact the Marketing and Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Workload**

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



## 5.117 Module: Secure Multiparty Computation [M-INFO-104119]

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

**Credits**  
3

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-108540	<a href="#">Secure Multiparty Computation</a>	3 CR	Müller-Quade

## M

**5.118 Module: Semantic Technologies [M-WIWI-101457]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Informatics](#)

**Credits**  
9

**Recurrence**  
Once

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
2

Election block: Wahlpflichtangebot (at least 2 items)			
T-WIWI-110548	<a href="#">Advanced Lab Informatics (Master)</a>	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-102874	<a href="#">Semantic Web Technologies</a>	4,5 CR	Sure-Vetter
T-WIWI-103112	<a href="#">Web Science</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.

**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.

**Prerequisites**

None

**Content**

The module Semantic Technologies covers the basics, methods and applications for intelligent systems in the World Wide Web. Fundamental to this are the scalable provision of knowledge, the provision of data as linked data, and methods for analyzing networks. Formal basics and practical aspects such as knowledge modelling and available tools for representation languages for ontologies are dealt with in detail. Methods for implementing intelligent systems on the World Wide Web will also be clarified and applications such as Web 2.0 or Service Science will be discussed and evaluated. Furthermore, methods for network analysis and the resulting findings are taught. These findings can be used to design recommendation systems and explain social networking phenomena. A variety of procedures exist to identify patterns that, if interpreted valuable, may provide previously unknown insights. This information can be predictive or descriptive.

**Workload**

The total workload for this module is approximately 270 hours.

**M****5.119 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: Wahlpflichtangebot (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****5.120 Module: Seminar Module Informatics [M-INFO-102822]**

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

**Part of:** [Research Course](#)

**Credits**  
3

**Recurrence**  
Each term

**Language**  
German/English

**Level**  
4

**Version**  
1

Election block: Seminar Informatik (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****5.121 Module: Seminar Module Law [M-INFO-101218]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [Research Course](#)

**Credits**  
3

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101997	<a href="#">Seminar: Legal Studies I</a>	3 CR	Dreier



## M

**5.122 Module: Service Analytics [M-WIWI-101506]**

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

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

**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	5

Election block: Wahlpflichtangebot (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****5.123 Module: Service Computing [M-WIWI-102827]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Informatics](#)

Credits	Language	Level	Version
9	German	4	2

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102666	<a href="#">Knowledge Discovery</a>	4,5 CR	Sure-Vetter
T-WIWI-110548	<a href="#">Advanced Lab Informatics (Master)</a>	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-102874	<a href="#">Semantic Web Technologies</a>	4,5 CR	Sure-Vetter
T-WIWI-102670	<a href="#">Practical Seminar Knowledge Discovery</a>	4 CR	Sure-Vetter
T-WIWI-103112	<a href="#">Web Science</a>	4,5 CR	Sure-Vetter

**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

- demonstrates basic competency in the areas of data and system integration on the web
- learn new Web-based architectures and applications, as well as concepts related to Web 2.0, Cloud Computing and Semantic Web
- know the different machine learning procedures for the supervised as well as the unsupervised learning
- learn methods regarding network theory and network analysis

**Prerequisites**

None.

**Content**

Services can be considered from different perspectives. Computer Science considers Services and Web Services traditionally as a piece of software, which fulfills a specific task. By the permanent rise of Cloud Applications, these services become more important. The offered Services and their functionalities have to be described sufficiently in order to be detectable.

In this module the most important network learning methods are introduced and their applicability is discussed with regard to different information sources

Furthermore, network analysis is presented, as well as architectures and descriptions for Services.

Thereby, the practical usability of the presented methods and algorithms in their particular fields of application are compared.

**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****5.124 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

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****5.125 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	3

Election block: Wahlpflichtangebot (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****5.126 Module: Service Innovation, Design & 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German	4	2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-105773	<a href="#">Digital Service Design</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-108437	<a href="#">Practical Seminar: Information Systems and Service Design</a>	4,5 CR	Mädche
T-WIWI-102799	<a href="#">Practical Seminar Service Innovation</a>	4,5 CR	Satzger
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****5.127 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 \(Wahlmodule WIWI\)](#)  
[Economics and Management \(Wahlmodule BWL\)](#)

Credits	Language	Level	Version
9	German/English	4	5

Mandatory			
T-WIWI-110280	<a href="#">Digital Services: Business Models and Transformation</a>	4,5 CR	Satzger
Election block: Ergänzungsangebot (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****5.128 Module: Service Operations [M-WIWI-102805]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics and Management \(Wahlmodule WIWI\)](#)

Credits	Language	Level	Version
9	German	4	6

Election block: Wahlpflichtangebot (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: Ergänzungsangebot (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

## 5.129 Module: Software Methods [M-INFO-101202]

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Level**  
4

**Version**  
2

Election block: Software-Methodik (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-101272	<a href="#">Natural Language Processing and Software Engineering</a>	3 CR	Tichy
T-INFO-101278	<a href="#">Model Driven Software Development</a>	3 CR	Reussner
T-INFO-101335	<a href="#">Empirical Software Engineering</a>	4 CR	Tichy
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****5.130 Module: Software Systems [M-INFO-101201]**

**Responsible:** Prof. Dr. Ralf Reussner  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Level**  
4

**Version**  
1

Election block: Software-Systeme (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-101272	<a href="#">Natural Language Processing and Software Engineering</a>	3 CR	Tichy
T-INFO-101278	<a href="#">Model Driven Software Development</a>	3 CR	Reussner
T-INFO-101339	<a href="#">Software Development for Modern, Parallel Platforms</a>	3 CR	Tichy
T-INFO-101325	<a href="#">Multicore Computers and Computer Clusters</a>	4 CR	Tichy
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

**5.131 Module: Stochastic Optimization [M-WIWI-103289]**

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics and Management (Wahlmodule WIWI)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
8

Election block: Wahlpflichtangebot (between 1 and 2 items)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-106548	Advanced Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-106549	Large-scale Optimization	4,5 CR	Rebennack
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-102723	Graph Theory and Advanced Location Models	4,5 CR	Nickel
T-WIWI-102719	Mixed Integer Programming I	4,5 CR	Stein
T-WIWI-102720	Mixed Integer Programming II	4,5 CR	Stein
T-WIWI-103124	Multivariate Statistical Methods	4,5 CR	Grothe
T-WIWI-102715	Operations Research in Supply Chain Management	4,5 CR	Nickel
T-WIWI-106545	Optimization under Uncertainty	4,5 CR	Rebennack
T-WIWI-110162	Optimization Models and Applications	4,5 CR	Sudermann-Merx
T-WIWI-106552	Simulation of Stochastic Systems	4,5 CR	Grothe, 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

- 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.



## 5.132 Module: Subdivision Algorithms [M-INFO-101864]

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

**Credits**  
5

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-103550	<a href="#">Subdivision Algorithms</a>	5 CR	Prautzsch

**Prerequisites**  
 None

## M

## 5.133 Module: Telematics [M-INFO-100801]

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

**Credits**  
6

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101338	<a href="#">Telematics</a>	6 CR	Zitterbart

**M****5.134 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: Praktikum (at most 1 item as well as at most 4 credits)			
T-INFO-103202	<a href="#">Analyzing Big Data - Laboratory Course</a>	4 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: Vorlesung (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

**5.135 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 \(Wahlmodule WIWI\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
2 semester

**Language**  
German/English

**Level**  
4

**Version**  
2

Election block: Wahlpflichtangebot (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

## 5.136 Module: Ubiquitous Computing [M-INFO-100789]

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

**Credits**  
5

**Recurrence**  
Each winter term

**Duration**  
1 term

**Language**  
German/English

**Level**  
4

**Version**  
1

Mandatory			
T-INFO-101326	<a href="#">Ubiquitous Computing</a>	5 CR	Beigl

**M****5.137 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: Ergänzungsangebot (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

## 5.138 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	Language	Level	Version
4	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

## 5.139 Module: Web Data Management [M-WIWI-101455]

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

**Credits**  
9

**Recurrence**  
Each term

**Duration**  
1 semester

**Language**  
German/English

**Level**  
4

**Version**  
3

Mandatory			
T-WIWI-102874	<a href="#">Semantic Web Technologies</a>	4,5 CR	Sure-Vetter
Election block: Ergänzungsangebot (between 4 and 5 credits)			
T-WIWI-110548	<a href="#">Advanced Lab Informatics (Master)</a>	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-103112	<a href="#">Web Science</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.

**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.

**Prerequisites**

The lecture *Semantic Web Technologies*[2511310] is obligatory and has to be absolved.

**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**

See German version.

**M****5.140 Module: Wireless Networking [M-INFO-101203]**

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

**Credits**  
8

**Recurrence**  
Each term

**Duration**  
1 semester

**Level**  
4

**Version**  
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 2019	2545105	<a href="#">Soziale Innovation unter die Lupe genommen</a>	2 SWS	Seminar (S)	Beyer
Exams					
SS 2019	7900017	<a href="#">Soziale Innovationen unter die Lupe genommen</a>		Prüfung (PR)	Weissenberger-Eibl

#### 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.

## 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
4

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	2400089	<a href="#">Access Control Systems: Foundations and Practice</a>	2 SWS	Lecture (V)	Grundmann, Hartenstein, Neudecker, Jacob
Exams					
SS 2019	7500247	<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

**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)

**Notes**

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.



## 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900248	<a href="#">Advanced Game Theory</a>		Prüfung (PR)	Puppe

**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)

**Learning Content**

This course offers an advanced and rigorous treatment of game theory.

**Workload**

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

## 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="#">Foundations of Information Systems</a>	2 SWS	Lecture (V)	Weinhardt, Mädche
WS 19/20	2540451		1 SWS	Practice (Ü)	Mädche, Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation).

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-109918 - Foundations of Information Systems](#) must not have been started.

**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

**Foundations of Information Systems**

2540450, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Description**

Information plays a central role in today's society. The resulting structures and processes cannot be explained intuitively with traditional approaches of economic theory. Formerly, information has only been implicitly treated as a production factor; its role as a competitive factor used to be neglected. In order to deal with the central role of information we developed the concept of the 'information lifecycle' that systematizes all phases from information generation to information distribution. The state of the art of economic theory is presented across this information lifecycle within the lectures.

The content of the lecture is deepened in accompanying lecture courses.

**Learning Content**

Information plays a central role in today's society. The resulting structures and processes cannot be explained intuitively with traditional approaches of economic theory. Formerly, information has only been implicitly treated as a production factor; its role as a competitive factor used to be neglected. In order to deal with the central role of information we developed the concept of the "information lifecycle" that systematizes all phases from information generation to information distribution. The single phases of that cycle,

- extraction/generation,
- storage,
- transformation,
- evaluation,
- 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 across this information lifecycle within the lectures. The content of the lecture is deepened in accompanying lecture courses.

**Workload**

The total workload for this course is approximately 150 hours. For further information see German version.

**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-INFO-102233 - Further Examinations](#)  
[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-101457 - Semantic Technologies](#)  
[M-WIWI-101477 - Development of Business Information Systems](#)  
[M-WIWI-102827 - Service Computing](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	1

Exams				
WS 19/20	7900038	<a href="#">Linked Data and the Semantic Web</a>	Prüfung (PR)	Sure-Vetter
WS 19/20	7900046	<a href="#">Sicherheit</a>	Prüfung (PR)	Volkamer
WS 19/20	7900047	<a href="#">Praktikum Betriebliche Informationssysteme: Realisierung innovativer Dienste für Studierende</a>	Prüfung (PR)	Oberweis
WS 19/20	7900102	<a href="#">Advanced Lab Information Service Engineering</a>	Prüfung (PR)	Sack
WS 19/20	7900107	<a href="#">Advanced Lab Cognitive Automobile and Robots</a>	Prüfung (PR)	Zöllner
WS 19/20	7900116	<a href="#">Advanced Lab Security, Usability and Society</a>	Prüfung (PR)	Volkamer
WS 19/20	7900187	<a href="#">Real-World Challenges in Data Science und Analytics</a>	Prüfung (PR)	Sure-Vetter

**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>.

## 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-104520 - Human Factors in Security and Privacy](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2019	2512552	<a href="#">Praktikum User Studies in Security and Privacy</a>	3 SWS	Practical course (P)	Volkamer, Gerber, Mayer
Exams					
SS 2019	7900129	<a href="#">Advanced Lab User Studies in Security</a>		Prüfung (PR)	Volkamer

**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 2019	2540535	<a href="#">Advanced Machine Learning</a>	2 SWS	Lecture (V)	Nazemi
SS 2019	2540536	<a href="#">Exercise Advanced Machine Learning</a>	1 SWS	Practice (Ü)	Nazemi
Exams					
SS 2019	7900227	<a href="#">Advanced Machine Learning</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

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

## V

**Advanced Machine Learning**

2540535, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning Content****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

**Workload****Time of attendance**

- Attending the lecture: 13 x 90min = 19h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m

**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.





## 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	79-2579907-00	<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:*



## Advanced Management Accounting

2579907, WS 19/20, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Notes

see Module Handbook

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](mailto:marc.wouters@kit.edu)).

### Learning Content

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.

### Annotation

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](mailto:marc.wouters@kit.edu)).

### Workload

The total workload for this course is approximately 135.0 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

**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)).

## T

## 6.12 Course: Advanced Statistics [T-WIWI-103123]

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900096	<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)

**Learning Content**

Basic principles  
 Types of convergence and limit theorems  
 Multivariate Distributions  
 Copulas  
 Simulation techniques, Bootstrap  
 Statistical Estimation  
 Statistical Testing  
 Simulation studies

**Literature**

Comprehensive lecture notes

## 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

**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-INFO-102233 - Further Examinations](#)  
[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 2019	2520527	<a href="#">Advanced Topics in Economic Theory</a>	2 SWS	Lecture (V)	Mitusch, Scheffel
SS 2019	2520528	<a href="#">Übung zu Advanced Topics in Economic Theory</a>	1 SWS	Practice (Ü)	Pegorari
Exams					
SS 2019	00227	<a href="#">Advanced Topics in Economic Theory</a>		Prüfung (PR)	Mitusch, Scheffel
SS 2019	7900291	<a href="#">Advanced Topics in Economic Theory</a>		Prüfung (PR)	Mitusch, Scheffel

**Competence Certificate**

The course T-WIWI-102609 "Advanced Topics in Economic Theory" restarts in summer term 2019.

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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

The course deals with basic elements of modern economic theory. It is divided into two parts. The first part introduces the microeconomic foundations of general equilibrium á la Debreu ("The Theory of Value", 1959) and Hildenbrand/Kirman ("Equilibrium Analysis", 1988). The second part deals with asymmetric information and introduces the basic techniques of contract theory.

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

**Workload**

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

**Literature**

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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2019	2400051	<a href="#">Algorithm Engineering</a>	2/1 SWS	Lecture (V)	Sanders, Lamm
Exams					
SS 2019	75514	<a href="#">Algorithm Engineering</a>		Prüfung (PR)	Sanders

## 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1

**T****6.17 Course: Algorithmic Methods for Network Analysis [T-INFO-104759]**

**Responsible:** Prof. Dr. Henning Meyerhenke  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102400 - Algorithmic Methods for Network Analysis](#)

Type
Oral examination

Credits
5

Recurrence
Irregular

Version
1



## 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2019	24638	<a href="#">Algorithmen für Routenplanung (mit Übungen)</a>	3 SWS	Lecture / Practice (VÜ)	Wagner, Buchhold, Zeitz, Zündorf, Sauer
Exams					
SS 2019	7500019	<a href="#">Algorithms for Routing</a>		Prüfung (PR)	Wagner

## 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
5

**Recurrence**  
Irregular

**Version**  
1

Events					
WS 19/20	24118	<a href="#">Algorithmen zur Visualisierung von Graphen</a>	2+1 SWS	Lecture / Practice (VÜ)	Wagner, Mtsentlintze, Radermacher, Ueckerdt

## 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500464	<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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2019	24622	<a href="#">Algorithms for Cellular Automata</a>	3 SWS	Lecture (V)	Worsch, Vollmar
Exams					
SS 2019	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-INFO-102233 - Further Examinations](#)  
[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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Examination of another type

**Credits**  
4

**Recurrence**  
Each summer term

**Version**  
2

Events					
SS 2019	24874	<a href="#">Analyzing Big Data Laboratory Course</a>	2 SWS	Practical course (P)	Böhm, Steinbuß
Exams					
SS 2019	7500091	<a href="#">Analyzing Big Data - Laboratory Course</a>		Prüfung (PR)	Böhm

**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	Each winter term	1

**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](#)

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					
SS 2019	7900065	<a href="#">Artificial Intelligence in Service Systems</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)

**Learning 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.



## 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-INFO-102233 - Further Examinations](#)  
[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 2019	2530555	<a href="#">Asset Pricing</a>	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530556	<a href="#">Übung zu Asset Pricing</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Reichenbacher
Exams					
SS 2019	7900110	<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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

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

**Learning Content**

This lecture deals with the valuation of risky cash flows. A stochastic discount model and a central equation will be introduced, which form the basis of nearly every valuation model in finance. That includes the valuation of stocks, bonds and derivatives. The first part of the lecture will present the theory, the second part covers empirical questions related to this approach.

**Workload**

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

**Literature**

**Basic literature**

- Asset pricing / Cochrane, J.H. - Rev. ed., Princeton Univ. Press, 2005.

**Elective literature**

- 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-101197 - Computer Security](#)  
[M-INFO-101198 - Advanced Topics in Cryptography](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500180	<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)

### Learning 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.

## 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900255	<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)**

**Learning Content**

This course deals with the analysis and modeling of auction which are based on game theory. This also includes aspects of applying and designing auctions as well as experiences with auctions. Main topics are:

- Single- and multi-unit auctions
- Selling and procurement auctions
- Electronic auctions (e.g. eBay, C2C, B2B)
- Multi-attributive auctions.

**Annotation**

We suggest to attend either Game Theory I or Decision Theory beforehand.

**Workload**

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

**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 Financial Advisory [T-WIWI-106495]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103261 - Disruptive FinTech Innovations](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

Events					
SS 2019	2530372	<a href="#">Automated Financial Advisory</a>	2 SWS	Seminar (S)	Ulrich
Exams					
SS 2019	7900124	<a href="#">Automated Financial Advisory</a>		Prüfung (PR)	Ulrich
SS 2019	7900290	<a href="#">Automated Financial Advisory</a>		Prüfung (PR)	Ulrich

**Competence Certificate**

The grade consists of a written thesis and an oral presentation.

**Prerequisites**

There are two conditions for taking this course:

1. This course is only open for registered students of the module "Disruptive FinTech Innovations".
2. Registered students do also attend in the same semester the lecture "Engineering FinTech Solutions" and the programming internship "Computational FinTech with Python and C++".

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

## V

**Automated Financial Advisory**

2530372, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Learning Content**

At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

**Workload**

The total workload for this course is approximately 90 hours.

**Literature**

Literature will be distributed during the first lecture.

## T

## 6.30 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**  
Oral examination

**Credits**  
5

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	2400026	<a href="#">Automated Planning and Scheduling</a>	2/1 SWS	Lecture / Practice (VÜ)	Balyo, Schreiber, Sanders

## T

**6.31 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-101238 - Automated visual inspection](#)  
[M-INFO-101239 - Machine Vision](#)  
[M-INFO-101241 - Image-based detection and classification](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500003	<a href="#">Automated Visual Inspection and Image Processing</a>		Prüfung (PR)	Beyerer
WS 19/20	7500008	<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)

**Description****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

**Learning Content**

- 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

## T

**6.32 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
Exams					
SS 2019	790unbe	<a href="#">Basics of German Company Tax Law and Tax Planning</a>		Prüfung (PR)	Wigger
WS 19/20	790unbe	<a href="#">Basics of German Company Tax Law and Tax Planning</a>		Prüfung (PR)	Wigger

**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.



## T

## 6.33 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500078	<a href="#">Big Data Analytics</a>		Prüfung (PR)	Böhm
SS 2019	7500280	<a href="#">Big Data Analytics</a>		Prüfung (PR)	Böhm

## T

## 6.34 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-102233 - Further Examinations](#)  
[M-INFO-102773 - Big Data Analytics 2](#)

**Type**  
Oral examination

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Events					
SS 2019	2400042	<a href="#">Big Data Analytics 2</a>	2 SWS	Lecture (V)	Böhm
Exams					
SS 2019	7500092	<a href="#">Big Data Analytics 2</a>		Prüfung (PR)	Böhm

**Prerequisites**  
none

## T

## 6.35 Course: Biologically Inspired Robot [T-INFO-101351]

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101251 - Autonomous Robotics](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2019	24619	<a href="#">Biologisch Motivierte Robotersysteme</a>	2 SWS	Lecture (V)	Rönnau, Dillmann
Exams					
SS 2019	7500237	<a href="#">Biologically Inspired Robot</a>		Prüfung (PR)	Dillmann

## T

**6.36 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Version
Oral examination	3	1

Events					
SS 2019	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 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

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

**Learning Content**

The student will acquire the basic theoretical and practical understanding of various technologies used in biometrics, the state-of-the-art algorithms used and their analysis. Student will be able to take advance courses in the field of computer vision/pattern recognition on the completion of this course.

**Literature**

- Tutorials and related scientific papers will be put on the web
- Online material on the topics discussed in the lectures

## T

**6.37 Course: Blockchains & 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					
SS 2019	7900260	<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.

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

## V

**Blockchains & Cryptofinance**

2530567, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Workload**

Gesamtaufwand bei 4,5 Leistungspunkten: ca. 135.0 Stunden

Präsenzzeit: 30 Stunden

Vor – und Nachbereitung der LV: 45.0 Stunden

Prüfung und Prüfungsvorbereitung: 60.0 Stunden

**T****6.38 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-INFO-102233 - Further Examinations](#)  
[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

**6.39 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101409 - Electronic Markets](#)  
[M-WIWI-101443 - Information Engineering and Management](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2019	2540500	<a href="#">Business Administration in Information Engineering and Management</a>	2 SWS	Lecture (V)	Geyer-Schulz
SS 2019	2540501	<a href="#">Übungen zu BWL der Informationsunternehmen</a>	1 SWS	Practice (Ü)	Nazemi
Exams					
SS 2019	7979537	<a href="#">Business Administration in Information Engineering and Management</a>		Prüfung (PR)	Geyer-Schulz

**Competence Certificate**

The lecture is no longer offered.

**Prerequisites**

None

**Recommendation**

Basic knowledge from Operations Research (linear programming) and from decision theory are expected.

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

## V

**Business Administration in Information Engineering and Management**

2540500, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

In this lecture, 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.

**Workload**

The total workload for this course is approximately 150 hours (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: 40h 00m
- Preparation of the examination: 31h 00m

**Sum: 150h 00m**

**Literature**

- G. Bamberg und A. G. Coenenberg (2006). Betriebswirtschaftliche Entscheidungslehre. (13. edition), chapter 1 - 8, pages 1 - 270.
- Russell, S. and Norvig, P. (1995). Artificial Intelligence: A Modern Approach The Intelligent Agent Book. Prentice-Hall, Upper Saddle River. chapter 2, pages 31 - 37.
- Porter, M. E. (1998a). Competitive Advantage: Creating and Sustaining Superior Performance. The Free Press, New York, 2 edition. chapter 1, pages 1 - 30
- Porter, M. E. (1998b). Competitive Strategy: Techniques for Analyzing Industries and Competitors. The Free Press, New York, 2 edition. chapters 1+2, pages 1 - 46
- Horngren, C. T., Datar, S. M., and Foster, G. (2003). Cost Accounting: A Managerial Emphasis. Prentice-Hall, Upper Saddle River, 11 edition. chapter 13, pages 446 - 460
- Cooper, W. W., Seiford, L. M., and Tone, K. (2000). Data Envelopment Analysis. Kluwer Academic Publishers, Boston. chapter 2, pages 21- 25
- Copeland, T. and Weston, F. (1988). Financial Theory and Corporate Policy. Addison-Wesley, Reading, 3 edition. pages 18 - 41 and chapter 4.E, pages 92 - 95].
- Myerson, R. B. (1997). Game Theory. Harvard University Press, London, 3 edition. pages 99-105.
- Milgrom, P. and Roberts, J. (1992). Economics, Organization and Management. Prentice Hill [Chapter 2, pp. 25-39].



## T

**6.40 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 2019	2540466	<a href="#">Business Data Analytics: Application and Tools</a>	2 SWS	Lecture (V)	Weinhardt, Dann, Staudt
SS 2019	2540467	<a href="#">Exercise Business Data Analytics: Application and Tools</a>	1 SWS	Practice (Ü)	Haubner, Dann, Frankenhauser, Staudt
Exams					
SS 2019	7900183	<a href="#">Business Data Analytics: Application and Tools</a>	Prüfung (PR)		Weinhardt
SS 2019	7900189	<a href="#">Business Data Analytics: Application and Tools</a>	Prüfung (PR)		Weinhardt

**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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

The ongoing digitalization and digitization of businesses, industries and societies is generating vast amounts of data. Hence, researchers and businesses are facing increasing pressure to build capabilities to cope with the data and generate value from the contained but yet to be discovered knowledge, insights and information. Researchers and practitioners tackling this task are referred to as data scientists and need skills at the intersection of programming, statistics and development operations. This course provides a hands-on perspective on these fields.

**Learning Content**

The aim of this course is to introduce practical foundations, concepts, tools and current practice of Analytics from a data scientist's perspective. The lecture is complemented with an Analytics challenge that is based on real-world data from research projects. The students immediately apply their newly acquired knowledge and learn to use a range of open source tools to solve the challenge.

Content:

- Conceptual and theoretical Foundations
- Programming languages common in data science
- Data acquisition, pre-processing
- Basics of data organization and DevOps
- Tool chain selection and automation
- Open source analytics frameworks and data processing infrastructures
- Applied analytics challenge (based on a current research project or a cooperation with an industry partner)

**Workload**

The total workload for this course is approximately 135 hours.

## T

**6.41 Course: Business Data Strategy [T-WIWI-106187]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**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:*

## V

**Business Data Strategy**

2540484, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Notes**

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.

**Learning 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.

### Literature

- Fleckenstein & Fellows (2017) – Modern Data Strategy
- Leimeister (2015) – Einführung in die Wirtschaftsinformatik
- Urbach & Ahlemann (2016) – IT-Management im Zeitalter der Digitalisierung
- DAMA International (2009) – The DAMA Guide to the Data Management Body of Knowledge (DAMA-DMBOK)

## T

**6.42 Course: Business Dynamics [T-WIWI-102762]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900278	<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)**

**Learning Content**

Corporate growth, the diffusion of new technologies, business processes, project management, product development, service quality management – all these are examples for application areas of business dynamics. They all are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such systems can be modelled. Simulations of complex systems allow the analysis, the goal centered design, as well as the optimization of markets, business processes, policies, and organizations.

**Annotation**

The course is generally held as block course.

**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**

**Literature**

John D. Sterman. Business Dynamics: Systems Thinking and Modeling for a Complex World. McGraw-Hill, 2000.

## T

**6.43 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900149	<a href="#">Business Intelligence Systems</a>		Prüfung (PR)	Mädche
SS 2019	7900270	<a href="#">Business Intelligence Systems</a>		Prüfung (PR)	Mädche

**Competence Certificate**

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

**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)

**Description**

In most modern enterprises, Business Intelligence Systems represent a core enabler of managerial 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.

The aim of this course is to introduce theoretical foundations, concepts, tools, and current practice of Business Intelligence Systems from a managerial and technical perspective. The lecture is complemented with a Business Intelligence System challenge, where students work with real-world data and enable system-based decision making using commercial Business Intelligence software packages.

**Learning Content**

- Conceptual Foundations
- Provisioning: ETL Process, Metadata, Data Warehouse & Data Marts and Big Data Technologies
- Consumption: Reporting, Dashboards and its relation to (Big Data) Analytics
- BI Strategy & Governance
- BI Implementation & Post-Implementation Management
- Business Intelligence System Challenge (in cooperation with industry partner)

**Literature**

- Turban, E., Aronson, J., Liang T.-P., Sharda, R. 2008. "Decision Support and Business Intelligence Systems". Pearson.
- 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.



## T

**6.44 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-INFO-102233 - Further Examinations](#)  
[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 2019	2540456	<a href="#">Internet Business Models</a>	2 SWS	Lecture (V)	Weinhardt, Peukert, Dann
SS 2019	2540457	<a href="#">Übungen zu Geschäftsmodelle im Internet: Planung und Umsetzung</a>	1 SWS	Practice (Ü)	Peukert, Dann
Exams					
SS 2019	7910454	<a href="#">Business Models in the Internet: Planning and Implementation</a>		Prüfung (PR)	Weinhardt
SS 2019	7979234	<a href="#">Business Models in the Internet: Planning and Implementation</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

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

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

## V

**Internet Business Models**

2540456, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

The emergence of internet economy has resulted in an accelerated evolution of commerce models in eBusiness. Early adopters have experimented with a variety of new business models, technologies and application designs. At the same time, there has been a growing demand for new standards to facilitate the exchange of information, catalogue content and transactions between buyers and sellers. But the true understanding of how to bring buyers and sellers together is still widely missing, leading to multiple cases of costly missed investments. This course focuses on the design and implementation of successful business models for eBusiness applications for the World Wide Web (WWW), imparting the basic knowledge for building successful eBusiness applications. We consider not only technical foundations of eBusiness applications but also economical aspects. In small groups, students develop and implement an eBusiness model that is eventually discussed with a representative from the venture capitalist industry.

**Learning Content**

The emergence of internet economy has resulted in an accelerated evolution of commerce models in eBusiness. Early adopters have experimented with a variety of new business models, technologies and application designs. At the same time, there has been a growing demand for new standards to facilitate the exchange of information, catalogue content and transactions between buyers and sellers. But the true understanding of how to bring buyers and sellers together is still widely missing, leading to multiple cases of costly missed investments. This course focuses on the design and implementation of successful business models for eBusiness applications for the World Wide Web (WWW), imparting the basic knowledge for building successful eBusiness applications. We consider not only technical foundations of eBusiness applications but also economical aspects. In small groups, students develop and implement an eBusiness model that is eventually discussed with a representative from the venture capitalist industry.

**Workload**

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

**Literature**

Will be announced within the course.

## T

**6.45 Course: Business Planning [T-WIWI-102865]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

**Type**  
Examination of another type

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	2545005	<a href="#">Geschäftsplanung für Gründer (Track 1)</a>	2 SWS	Seminar (S)	Terzidis, Tittel, Ntagiakou
WS 19/20	2545007	<a href="#">Business Planning for Founders (ENTECH)</a>	2 SWS	Seminar (S)	Wohlfeil, Bauman
WS 19/20	2545020	<a href="#">Business Planning for Founders (EUCOR Edition)</a>	2 SWS	Seminar (S)	Terzidis
Exams					
SS 2019	7900054	<a href="#">Business Planning</a>		Prüfung (PR)	Terzidis
WS 19/20	7900023	<a href="#">Business Planning for Founders</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

**Geschäftsplanung für Gründer (Track 1)**

2545005, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Description**

This seminar introduces basic concepts of business planning for entrepreneurs to the participants. It focusses on practical concepts and hands-on methods on how to turn business ideas into solid businesses (e.g. Business Modelling, Market Potential, Planning of Resources, and further more) and on the creation of a realistic and viable Business Plan (with or without Venture Capital)

## V

**Business Planning for Founders (EUCOR Edition)**

2545020, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Description**

This seminar introduces basic concepts of business planning for entrepreneurs to the participants. It focusses on practical concepts and hands-on methods on how to turn business ideas into solid businesses (e.g. Business Modelling, Market Potential, Planning of Resources, and further more) and on the creation of a realistic and viable Business Plan (with or without Venture Capital)

**Annotation**

Please register on the seminar website.

**WARNING:** creditability in Seminar Module

The EnTechnon seminars are NOT accepted in the seminar module! The credit is only possible in MODULE ENTREPRENEURSHIP. One Exception is the seminar "Entrepreneurship Research".

## T

**6.46 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-101487 - Sales Management](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

**Type**  
Examination of another type

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Events					
WS 19/20	2545020	<a href="#">Business Planning for Founders (EUCOR Edition)</a>	2 SWS	Seminar (S)	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)**

**Description**

This seminar introduces basic concepts of business planning for entrepreneurs to the participants. It focusses on practical concepts and hands-on methods on how to turn business ideas into solid businesses (e.g. Business Modelling, Market Potential, Planning of Resources, and further more) and on the creation of a realistic and viable Business Plan (with or without Venture Capital)

**Annotation**

Please register on the seminar website.

WARNING: creditability in Seminar Module

The EnTechnon seminars are NOT accepted in the seminar module! The credit is only possible in MODULE ENTREPRENEURSHIP. One Exception is the seminar "Entrepreneurship Research".

## T

**6.47 Course: Business Strategies of Banks [T-WIWI-102626]**

**Responsible:** Prof. Dr. Wolfgang Müller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900079	<a href="#">Business Strategies of Banks</a>		Prüfung (PR)	Müller

**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)

**Description**

The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank's success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management's perspective.

The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank's corporate policy.

**Learning Content**

The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank's success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management's perspective.

The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank's corporate policy.

**Workload**

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

**Literature**

**Elective literature:**

- A script is disseminated chapter by chapter during the course of the lecture.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2000, Bankbetriebslehre, 6th edition, Springer

## 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-INFO-102233 - Further Examinations](#)  
[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

**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**

Seminar (S)

2545105, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Learning 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.

**Workload**

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

## 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-INFO-102233 - Further Examinations](#)  
[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 2019	2550494	<a href="#">Challenges in Supply Chain Management</a>	3 SWS	Lecture (V)	Mohr
Exams					
SS 2019	7900146	<a href="#">Challenges in Supply Chain Management</a>		Prüfung (PR)	Nickel

**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 2019, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning 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.

**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.



**Workload**

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

**Literature**

To be defined depending on the topic.

## T

## 6.50 Course: Cognitive Systems [T-INFO-101356]

**Responsible:** Prof. Dr.-Ing. Rüdiger Dillmann  
Prof. Dr. Alexander Waibel

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-100819 - Cognitive Systems](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2019	24572	<a href="#">Kognitive Systeme</a>	4 SWS	Lecture / Practice (VÜ)	Dillmann, Waibel, Stüker, Meißner
Exams					
SS 2019	7500157	<a href="#">Cognitive Systems</a>		Prüfung (PR)	Dillmann, Waibel

## 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					
SS 2019	7900274	<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)**

**Description**

Network or infrastructure industries like telecommunication, transport, and utilities form the backbone of modern economies. The lecture provides an overview of the economic characteristics of network industries. The planning of networks is complicated by the multitude of aspects involved (like spatial differentiation and the like). The interactions of different companies - competition or cooperation or both - are characterized by complex interdependencies within the networks: network effects, economies of scale, effects of vertical integration, switching costs, standardization, compatibility etc. appear increasingly in these sectors and even tend to appear in combination. Additionally, government interventions can often be observed, partly driven by the aims of competition policy and partly driven by the aims industrial policy. All these issues are brought up, analyzed formally (in part) and illustrated by several examples in the lecture.

**Workload**

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

**Literature**

Will be announced in the lecture.

**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**  
Each term

**Version**  
1

Events					
WS 19/20	2400063	<a href="#">Computational Complexity Theory, with a View Towards Cryptography</a>	4 SWS	Lecture (V)	Hofheinz
Exams					
SS 2019	7500183	<a href="#">Computational Complexity Theory, with a View Towards Cryptography</a>		Prüfung (PR)	Geiselman, 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)****Description**

What is an "efficient" algorithm? Can every algorithmic task be solved efficiently? Or are there inherently hard problems?

Computational complexity provides a rigorous, mathematical foundation to reason about problems like these. In this course, we will discuss concepts such as

- machine model, time and space complexity, separations,
- nondeterminism, reductions, completeness,
- the polynomial hierarchy,
- probabilism, one-way functions,
- alternation, interactive proofs, zero-knowledge,

and illustrate them with practical examples. The course provides an outlook to applications of computational complexity theory, with a view towards cryptography."

## T

## 6.53 Course: Computational FinTech with Python and C++ [T-WIWI-106496]

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103261 - Disruptive FinTech Innovations](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each summer term	1

Events					
SS 2019	2530373	<a href="#">Computational FinTech with Python and C++</a>	1 SWS	Practical course (P)	Ulrich
Exams					
SS 2019	7900123	<a href="#">Computational FinTech with Python and C++</a>	Prüfung (PR)		Ulrich
SS 2019	7900289	<a href="#">Computational FinTech with Python and C++</a>	Prüfung (PR)		Ulrich

**Competence Certificate**

The grade is based on a larger or several smaller programming exercises.

**Prerequisites**

There are two conditions for taking this course:

1. This course is only open for registered students of the module "Disruptive FinTech Innovations".
2. Registered students do also attend in the same semester the lecture "Engineering FinTech Solutions" and the seminar "Automated Financial Advisory".

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

## V

**Computational FinTech with Python and C++**

2530373, SS 2019, 1 SWS, Language: English, [Open in study portal](#)

**Practical course (P)**

**Learning Content**

At the beginning of the semester, each student receives a personalized set of programming tasks .

**Workload**

Roughly 45 hours.

## T

## 6.54 Course: Computational Geometry [T-INFO-104429]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101214 - Algorithms in Computer Graphics](#)  
[M-INFO-102110 - Computational Geometry](#)  
[M-INFO-102233 - Further Examinations](#)

Type
Oral examination

Credits
5

Recurrence
Irregular

Version
1

T

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

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-105032 - Data Science for Finance](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each winter term

**Version**  
3

Events					
WS 19/20	2500015	<a href="#">Computational Risk and Asset Management</a>	4 SWS	Lecture (V)	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)

**Description**

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.

**Learning Content**

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

**Workload**

The total workload for this course is approximately 180 hours.

## T

**6.56 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-INFO-102233 - Further Examinations](#)  
[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****6.57 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-INFO-102233 - Further Examinations](#)  
[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

**6.58 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500066	<a href="#">Computer Contract Law</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500065	<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)

**Description**

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.

**Learning Content**

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

**Elective Literature**

tba in the transparencies

## T

**6.59 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	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**

Lecture (V)

24180, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

**Description**

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

**Learning Content**

The student acquires a basic understanding of computer vision topics within the context of human-computer interaction and learns how to apply them.

## T

**6.60 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](#)  
[M-INFO-102233 - Further Examinations](#)

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

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)

**Description**

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.

## T

## 6.61 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 2019	2400099	<a href="#">Context Sensitive Systems</a>	1 SWS	Practice (Ü)	Riedel
SS 2019	24658	<a href="#">Context Sensitive Systems</a>	2 SWS	Lecture (V)	Riedel, Beigl
Exams					
SS 2019	7500208_01	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Riedel, Beigl
SS 2019	7500208_02	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Riedel, Beigl
SS 2019	7500208_190821	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Riedel, Beigl
SS 2019	7500208_190822	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Beigl, Riedel
SS 2019	7500208_191010	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Beigl, Riedel
SS 2019	7500208_191011	<a href="#">Context Sensitive Systems</a>		Prüfung (PR)	Riedel, Beigl

## T

**6.62 Course: Convex Analysis [T-WIWI-102856]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
SS 2019	2550120	<a href="#">Konvexe Analysis</a>	SWS	Lecture (V)	Stein
Exams					
SS 2019	7900067_SS2019_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)).

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

## V

**Konvexe Analysis**

2550120, SS 2019, SWS, [Open in study portal](#)

Lecture (V)

**Learning Content**

Convex Analysis deals with properties of convex functions and convex sets, in particular with respect to the minimization of convex functions over convex sets. That the involved functions are not necessarily assumed to be differentiable allows a number of applications which are not covered by techniques from smooth optimization, e.g. approximation problems with respect to the Manhattan or maximum norms, classification problems or the theory of statistical estimates. The lecture develops along another, geometrically simple example, where a nonsmooth obstacle set is to be described by a single smooth convex constraint such that minimal and maximal distances to the obstacle can be computed. The lecture is structured as follows:

- Introductory examples and terminology
- Convex subdifferential, Lipschitz continuity and the safety margin
- Normal cones, error bounds and the maximal distance

**Literature****Elective literature:**

- J. Borwein, A. Lewis, Convex Analysis and Nonlinear Optimization: Theory and Examples (2 ed.), Springer, 2006.
- S. Boyd, L. Vandenberghe, Convex Optimization, Cambridge University Press, 2004.
- O. Güler, Foundations of Optimization, Springer, 2010.
- J.-B. Hiriart-Urruty, C. Lemarechal, Fundamentals of Convex Analysis, Springer, 2001.
- R.T. Rockafellar, Convex Analysis, Princeton University Press, 1970.
- R.T. Rockafellar, R.J.B. Wets, Variational Analysis, Springer, Berlin, 1998.

## T

## 6.63 Course: Copyright [T-INFO-101308]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.64 Course: Corporate Compliance [T-INFO-101288]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101242 - Governance, Risk & Compliance](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	2400087	<a href="#">Corporate Compliance</a>	2 SWS	Lecture (V)	Herzig
Exams					
SS 2019	7500063	<a href="#">Corporate Compliance</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500063	<a href="#">Corporate Compliance</a>		Prüfung (PR)	Dreier, Matz



## T

**6.65 Course: Corporate Financial Policy [T-WIWI-102622]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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	see Annotations	1

Exams				
SS 2019	7900073	<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

**Annotation**

The course will exceptionally be held in the winter semester 2019/2020. Usually, however, the event takes place in the summer semester.

## T

**6.66 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					
SS 2019	2530218	<a href="#">Corporate Risk Management</a>	SWS	Lecture (V)	Ruckes, Hoang
SS 2019	2530219	<a href="#">Übung zu Corporate Risk Management</a>	SWS	Practice (Ü)	Silbereis, Ruckes, Hoang
WS 19/20	2530220		SWS	Practice (Ü)	Ruckes, Hoang, Silbereis
Exams					
SS 2019	7900259	<a href="#">Corporate Risk Management</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**

None

**Annotation**

The course is offered as a block course in the summer term.

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

## V

**Corporate Risk Management**

2530218, SS 2019, SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning Content**

- Stochastic basics
- Firm decisions under risk - expected utility theory
- The value motive for corporate risk management
- Common risk measures from practice (e.g. Cash-flow at Risk)
- Operational and financial risk management instruments
- The risk management organization (central vs. decentral)
- External risk reporting (e.g. obligations and incentives)

**Workload**

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

**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 2019, SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Learning Content**

- Stochastic basics
- Firm decisions under risk - expected utility theory
- The value motive for corporate risk management
- Common risk measures from practice (e.g. Cash-flow at Risk)
- Operational and financial risk management instruments
- The risk management organization (central vs. decentral)
- External risk reporting (e.g. obligations and incentives)

**Workload**

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

**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.

2530220, WS 19/20, SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Learning Content**

- Stochastic basics
- Firm decisions under risk - expected utility theory
- The value motive for corporate risk management
- Common risk measures from practice (e.g. Cash-flow at Risk)
- Operational and financial risk management instruments
- The risk management organization (central vs. decentral)
- External risk reporting (e.g. obligations and incentives)

**Workload**

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

**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

**6.67 Course: Country Manager Simulation [T-WIWI-106137]**

**Responsible:** Dr. Sven Feurer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - Sales Management](#)  
[M-WIWI-101490 - Marketing Management](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each winter term	2

Events					
WS 19/20	2572172	<a href="#">Country Manager</a>	1 SWS	Block (B)	Feurer

**Competence Certificate**

Alternative exam assessment (30 minutes presentation).

**Prerequisites**

If the course is selected within the module "Sales Management", the following courses may not be started in this module: price negotiations and sales presentations, case studies in sales and pricing.

**Annotation**

The course language is 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 this 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.

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

## V

**Country Manager**

2572172, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

**Block (B)**

**Learning Content**

Understanding Culture  
 Understanding International Buyer Behavior  
 Market Entry Decisions  
 International Marketing and Sales Management (adaptation vs. differentiation)

**Annotation**

- The course language is 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.

**Workload**

Total workload for 1.5 ECTS: ca. 45 hours

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

## T

## 6.68 Course: Credit Risk [T-WIWI-102645]

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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	<a href="#">Credit Risk</a>	3 SWS	Lecture / Practice (VÜ)	Uhrig-Homburg, Mitarbeiter
Exams					
SS 2019	7900113	<a href="#">Credit Risk</a>		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 and may be supplemented by a non exam assessment according to § 4 paragraph 2 Nr. 3. 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)

**Description**

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

**Learning 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

**Workload**

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

**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).

**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).

## T

## 6.69 Course: Critical Information Infrastructures [T-WIWI-109248]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900061	<a href="#">Critical Information Infrastructures</a>		Prüfung (PR)	Sunyaev
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)

**Notes**

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****6.70 Course: Cryptographic Voting Schemes [T-INFO-101279]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101197 - Computer Security](#)  
[M-INFO-101198 - Advanced Topics in Cryptography](#)  
[M-INFO-102233 - Further Examinations](#)

Type
Oral examination

Credits
3

Recurrence
Irregular

Version
1

**T****6.71 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-INFO-102233 - Further Examinations](#)  
[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

## 6.72 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
4

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24074	<a href="#">Data and Storage Management</a>	2 SWS	Lecture (V)	Neumair

## T

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

**Responsible:** Rheza Nakhaeizadeh  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2520375	<a href="#">Data Mining and Applications</a>	2/4 SWS	Lecture (V)	Nakhaeizadeh
Exams					
SS 2019	7900102	<a href="#">Data Mining and Applications (Lecture)</a>		Prüfung (PR)	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 2019, 2/4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

## Part one: Data Mining

## Why 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**

The total workload for this course is approximately 135 hours. For further information see German version.

**Literature**

U. Fayyad, G. Piatetsky-Shapiro, P. Smyth, R. Uthurusamy, editors, Advances in Knowledge Discovery and Data Mining, AAAI/MIT Press, 1996 (order on-line 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

## 6.74 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**  
Written examination

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Exams				
SS 2019	7500235	<a href="#">Data Privacy: From Anonymization to Access Control</a>	Prüfung (PR)	Böhm

## T

## 6.75 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					
SS 2019	7500223	<a href="#">Data protection by design</a>		Prüfung (PR)	Raabe

## T

## 6.76 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24018	<a href="#">Datenschutzrecht</a>	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500083	<a href="#">Data Protection Law</a>		Prüfung (PR)	Marsch



## T

## 6.77 Course: Database Systems [T-INFO-101497]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101178 - Communication and Database Systems](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
4

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	24516	<a href="#">Datenbanksysteme</a>	2 SWS	Lecture (V)	Böhm, Mülle
Exams					
SS 2019	7500166	<a href="#">Database Systems</a>		Prüfung (PR)	Böhm

## T

**6.78 Course: Database Systems and XML [T-WIWI-102661]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900046	<a href="#">Database Systems and XML</a>		Prüfung (PR)	Oberweis
WS 19/20	7900007	<a href="#">Database Systems and XML</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)**

**Notes**

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

**T****6.79 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type
Oral examination

Credits
5

Recurrence
Irregular

Version
1

**Prerequisites**  
none

## T

## 6.80 Course: Deep Learning and Neural Networks [T-INFO-109124]

**Responsible:** Prof. Dr. Alexander Waibel  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-INFO-104460 - Deep Learning and Neural Networks](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	2400024	<a href="#">Deep Learning and Neural Networks</a>	4 SWS	Lecture (V)	Waibel, Pham
Exams					
SS 2019	7500044	<a href="#">Deep Learning and Neural Networks</a>		Prüfung (PR)	Waibel

## T

**6.81 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**  
Written examination**Credits**  
3**Recurrence**  
Each summer term**Version**  
1

Events					
SS 2019	24628	<a href="#">Deep Learning for Computer Vision</a>	2 SWS	Lecture (V)	Stiefelhagen, Sarfraz
Exams					
SS 2019	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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Learning Content**

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

**Annotation**

The lecture is partially given in German and English.

## T

## 6.82 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500090	<a href="#">Deployment of Database Systems</a>		Prüfung (PR)	Böhm

## T

**6.83 Course: Derivatives [T-WIWI-102643]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2530550	<a href="#">Derivatives</a>	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530551	<a href="#">Übungen zu Derivate</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Eska
Exams					
SS 2019	7900111	<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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

The lecture deals with the application areas and valuation of financial derivatives. After an overview of the most important derivatives and their relevance, forwards and futures are analysed. Then, an introduction to the Option Pricing Theory follows. The main emphasis is on option valuation in discrete and continuous time models. Finally, construction and usage of derivatives are discussed, e.g. in the context of risk management.

**Learning Content**

The lecture deals with the application areas and valuation of financial derivatives. After an overview of the most important derivatives and their relevance, forwards and futures are analysed. Then, an introduction to the Option Pricing Theory follows. The main emphasis is on option valuation in discrete and continuous time models. Finally, construction and usage of derivatives are discussed, e.g. in the context of risk management.

**Workload**

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

**Literature**

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

**Elective literature:**

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

## T

## 6.84 Course: Design Thinking [T-WIWI-102866]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

**Type**  
Examination of another type

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	2545008	<a href="#">Design Thinking (Track 1)</a>	2 SWS	Seminar (S)	Terzidis, Jochem, Lau
WS 19/20	2545008	<a href="#">Design Thinking (Track 1)</a>	2 SWS	Seminar (S)	Jochem, Terzidis, Lau
Exams					
SS 2019	7900053	<a href="#">Design Thinking (Track 1)</a>		Prüfung (PR)	Terzidis
WS 19/20	7900084	<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.



T

**6.85 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	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

## 6.86 Course: Digital Circuits Design [T-INFO-103469]

**Responsible:** Prof. Dr. Wolfgang Karl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-INFO-102978 - Digital Circuits Design](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	24007	<a href="#">Digitaltechnik und Entwurfsverfahren</a>	3 SWS	Lecture (V)	Hanebeck, Bromberger
Exams					
SS 2019	7500254	<a href="#">Digital Circuits Design</a>		Prüfung (PR)	Henkel, Karl, Tahoori

## T

## 6.87 Course: Digital Health [T-WIWI-109246]

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900062	<a href="#">Digital Health</a>		Prüfung (PR)	Sunyaev
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)**

### Notes

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

**6.88 Course: Digital Marketing and Sales in B2B [T-WIWI-106981]**

**Responsible:** Anja Konhäuser  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - 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

**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.)

**Learning 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.

**Workload**

time of presentness = 15 hrs.

private study = 30 hrs.

**Literature**

-

## T

**6.89 Course: Digital Service Design [T-WIWI-105773]**

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-102806 - Service Innovation, Design & Engineering](#)  
[M-WIWI-104080 - Designing Interactive Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	1

Events					
WS 19/20	2540420	<a href="#">Digital Service Design</a>	2 SWS	Lecture (V)	Mädche
Exams					
SS 2019	7900190	<a href="#">Digital Service Design</a>		Prüfung (PR)	Mädche

**Competence Certificate**

Assessment consists of a written exam of 1 hour length and by submitting written papers as part of the exercise Details are 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, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

Designing services is different from designing products. In contrast to products being discrete and tangible objects, services are co-produced by people and only provide value when they are actually used. Digital services represent a specific category of services and specifically leverage and integrate information technology in the service delivery process.

The aim of this course is to introduce key concepts and theoretical foundations of digital service design. Furthermore, a management perspective looking at the entire service lifecycle, covering the organizational and team level as well as state-of-the-art digital service design processes (e.g. agile, lean, continuous delivery) is provided. Finally, an introduction of important digital service design practices and tools supporting user research, conceptualization & prototyping as well as evaluation is given.

The lecture is complemented with a Digital Service Design challenge, where students leverage practices and tools from the lecture to suggest improvements for an existing digital service. The challenge is carried out in cooperation with practice partners (e.g. Commerzbank).

**Learning Content**

- Definition and key concepts of digital service design and related terms
- Introduction to the business and design perspective of a service design project
- The digital service design process from strategy through planning and prototyping to launching the digital service.
- Practice-oriented capstone project focusing on the design of a real-world digital service

**Literature**

Benyon, D. (2014). *Designing interactive systems: A comprehensive guide to HCI, UX and interaction design* (3. ed.). Harlow: Pearson.

Williams, Kevin, Samir Chatterjee, and Matti Rossi. 2008. "Design of Emerging Digital Services: A Taxonomy." *European Journal of Information Systems* 17(5): 505–17

Hill, T.P. 1977. "On Goods and Services." *The review of income and wealth* 23(4): 315–38.

Werder K, Zobel B, Maedche A (2016) PDISC -- Towards a Method for Software Product DIScovery. In: Maglyas A, Lamprecht A-L (eds) *Softw. Bus. 7th Int. Conf. ICSOB 2016*, Ljubljana, Slov. June 13-14, 2016, Proc. Springer International Publishing, Cham, pp 47–62

Pichler R (2016) *Strategize: Product Strategy and Product Roadmap Practices for the Digital Age*. Pichler Consulting

Liu, X., Werder, K., & Maedche, A. (2016). A Taxonomy of Digital Service Design Techniques. In *Proceedings of the 2016 International Conference on Information Systems*



## T

**6.90 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

**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)**

**Notes**

Formerly "Business and IT Service Management"

**Learning 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.

**Workload**

The total workload for this course is approximately 135 hours. For further information see German version.

**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

**6.91 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
SS 2019	24654	<a href="#">Digital Signatures</a>	2 SWS	Lecture (V)	Hofheinz
Exams					
SS 2019	7500182	<a href="#">Digital signatures</a>		Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz

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

## V

**Digital Signatures**

24654, SS 2019, 2 SWS, [Open in study portal](#)

Lecture (V)

**Learning Content**

Digital signatures are a fundamental primitive of modern cryptography. Their practical applications include, for instance, authenticated e-mail or certificate hierarchies on the internet.

This lecture will give an overview of important signature schemes with theoretical or practical relevance. This includes:

- One-time signatures, tree-based signatures, and chameleon hash functions
- RSA-based signatures
- Signatures in bilinear groups

Goal of this lecture is not only to describe these schemes, but also to discuss their security. Therefore we will introduce various security notions for digital signatures, and analyze whether the presented schemes provably meet these notions (under certain hardness assumptions).

Depending on the student's preferences, the remaining time will be used to discuss advanced topics, such as:

- Schnorr signatures
- Programmable hash functions
- Tightness of reductions
- Analysis of hardness assumptions in the generic group model

## T

## 6.92 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 2019	2545103	<a href="#">Digitale Transformation und Geschäftsmodelle</a>	2 SWS	Seminar (S)	Koch
Exams					
SS 2019	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.

## T

**6.93 Course: Digital Transformation of Organizations [T-WIWI-106201]**

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2540556	<a href="#">Digital Transformation of Organizations</a>	3 SWS	Lecture (V)	Mädche
Exams					
SS 2019	791000001	<a href="#">Digital Transformation of Organizations</a>		Prüfung (PR)	Mädche

**Competence Certificate**

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:*

## V

**Digital Transformation of Organizations**

2540556, SS 2019, 3 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Description**

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, IT is considered as key enabler of operational excellence ranging from the enrichment of routine working tasks (e.g., enterprise resource planning systems) to e-enabled integration of entire business eco-systems (e.g., e-supply chains). Complementing this primarily company-internal perspective on IT, we have recently have seen a massive growth of digital extensions of existing products and services across all industries. The disruptive potential of IT has already transformed selected key industries, e.g. media or retail, and its impact is continuously growing in all areas of business and society. Large-scale information systems (IS) in organizations strongly interplay with work practices of individual employees as well as organizational structures shaping and being shaped by individuals' behavior. Thus, successful implementation of IS requires dealing with transformation beyond technology. The ability to implement and use IS in a way supporting its overall value proposition has become a central success determinant. Accordingly, the course "Management of Information Systems" course is designed to provide a comprehensive insight into theoretical foundations, concepts, tools, and current practice of IS. The lecture is complemented with a case study. Students get the opportunity to analyze and propose solutions for a selected real-world IS implementation.

**Learning Content**

- Definition and key concepts of Information Systems
- Introduction of different types of application systems (organizational process & information-centric systems, customer-centric systems, supplier-centric systems and people-centric systems) and their characteristics
- The digital transformation process: The pre-implementation, implementation and post-implementation phase covering facets such as business/IT alignment, packaged software selection, IS implementation projects, as well as adoption & use of IS
- Practice-oriented case study focusing on real-world IS scenarios

**Literature**

Daft, R. L. (2009). Organization theory and design. Cengage learning.

Laudon, K. C. and Laudon, J. P. (2014). Management Information Systems: Managing the Digital Firm, 13th Edition, Pearson.

Sambamurthy, V and Zmud, R. Z. (2012). Guiding the Digital Transformation of Organizations. Legerity Digital Press, ISBN 978-0-9857955-0-4.

## T

**6.94 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-INFO-102233 - Further Examinations](#)  
[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 2019	2550488	<a href="#">Ereignisdiskrete Simulation in Produktion und Logistik</a>	3 SWS	Lecture (V)	Spieckermann
Exams					
SS 2019	7900136	<a href="#">Discrete-Event Simulation in Production and Logistics</a>		Prüfung (PR)	Nickel

**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 2019, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Learning 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.

**Annotation**

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

Besides knowledge of Operations Research students are assumed to be familiar with the following topics:

- Introduction in Statistics
- Programming basics (algorithms and data structures)
- Basic knowledge in production and logistics

**Workload**

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

**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

## 6.95 Course: Distributed Computing [T-INFO-101298]

**Responsible:** Prof. Dr. Achim Streit  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101210 - Dynamic IT-Infrastructures](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500282	<a href="#">Distributed Computing</a>		Prüfung (PR)	Streit

## T

## 6.96 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**  
Written examination

**Credits**  
4,5

**Recurrence**  
Each winter term

**Version**  
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					
SS 2019	7900231	<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)**

**Description**

The course Dynamic Macroeconomics addresses macroeconomic questions on an advanced level. The main focus of this course is on dynamic programming and its fundamental role in modern macroeconomics. After starting with the necessary mathematical tools, several applications in labor economics, economic growth, and asset pricing are introduced. The course pursues a hands-on approach so that students not only gain theoretical insights but also learn numerical tools to solve dynamic economic models using the modern programming language Python.

**Workload**

The total workload for this course is approximately 135 hours. For further information see German version.

**Literature**

Literature and lecture notes are provided during the course.

## T

**6.97 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each summer term	1

Events					
SS 2019	2581006	<a href="#">Efficient Energy Systems and Electric Mobility</a>	2 SWS	Lecture (V)	Jochem, McKenna
Exams					
SS 2019	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 2019, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Learning 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.

The energy efficiency part of the lecture provides an introduction to the concept of energy efficiency, the means of affecting it and the relevant framework conditions. Further insights into economy-wide measurements of energy efficiency, and associated difficulties, are given with recourse to several practical examples. The problems associated with market failures in this area are also highlighted, including the Rebound Effect. Finally and by way of an outlook, perspectives for energy efficiency in diverse economic sectors are examined.

The electric mobility part of the lecture examines all relevant issues associated with an increased penetration of electric vehicles including their technology, their impact on the electricity system (power plants and grid), their environmental impact as well as their optimal integration in the future private electricity demand (i.e. smart grids and V2G). Besides technical aspects the user acceptance and behavioral aspects are also discussed.

**Workload**

The total workload for this course is approximately 105.0 hours. For further information see German version.

**Literature**

Will be announced in the lecture.

## T

**6.98 Course: eFinance: Information Systems for Securities Trading [T-WIWI-109941]**

**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	2

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

**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

**Recommendation**

None

*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)**

**Description**

The theoretical part of the course examines the New Institutions Economics which provides a theoretically found explanation for the existence of markets and intermediaries. Building upon the foundations of the market micro structure, several key parameters and factors of electronic trading are examined. These insights gained along a structured securities trading process are complemented and verified by the analysis of prototypical trading systems developed at the institute as well as selected trading systems used by leading exchanges in the world. In the more practical-oriented second part of the lecture, speakers from practice will give talks about financial trading systems and link the theoretical findings to real-world systems and applications.

**Learning Content**

The theoretical part of the course examines the New Institutions Economics which provides a theoretically found explanation for the existence of markets and intermediaries. Building upon the foundations of the market micro structure, several key parameters and factors of electronic trading are examined. These insights gained along a structured securities trading process are complemented and verified by the analysis of prototypical trading systems developed at the institute as well as selected trading systems used by leading exchanges in the world. In the more practical-oriented second part of the lecture, speakers from practice will give talks about financial trading systems and link the theoretical findings to real-world systems and applications.

**Workload**

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

**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

**Elective literature:**

- 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****6.99 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

**Competence Certificate**

The alternative exam assessment consists of a final thesis.

**Prerequisites**

None.

**Annotation**

The course is usually held as a block course.

## T

**6.100 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

**Competence Certificate**

The alternative exam assessment consists of a final thesis.

**Prerequisites**

None.

**Annotation**

The course is usually held as a block course.

## T

**6.101 Course: Emissions into the Environment [T-WIWI-102634]**

**Responsible:** Ute Karl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)

**Learning Content**

The course will provide an overview of sources of air pollution, waste and municipal waste; methods to monitor and to reduce/manage pollutant flows; regulatory framework on national and international level.

**A Air pollution control**

- Introduction and definitions
- Sources and pollutants
- Regulatory framework
- Emission monitoring
- Air pollution control measures

**B Waste management and Recycling**

- Introduction and regulatory framework
- Statistics and logistics
- Recycling and disposal
- Waste treatment

**C Waste water treatment**

- Municipal waste water treatment systems
- Sewage sludge disposal

**Workload**

The total workload for this course is approximately 105 hours. For further information see German version.

**Literature**

Will be announced in the course.



## T

## 6.102 Course: Empirical Software Engineering [T-INFO-101335]

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101202 - Software Methods](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
4

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24156	<a href="#">Empirische Softwaretechnik</a>	2 SWS	Lecture (V)	Tichy, Hey
Exams					
SS 2019	7500168	<a href="#">Empirical Software Engineering</a>		Prüfung (PR)	Tichy
WS 19/20	7500150	<a href="#">Empirical Software Engineering</a>		Prüfung (PR)	Tichy

## T

## 6.103 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500097	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500040	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.104 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2019	24668	<a href="#">Employment Law II</a>	2 SWS	Lecture (V)	Hoff
Exams					
SS 2019	7500098	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500058	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.105 Course: Energy and Environment [T-WIWI-102650]

**Responsible:** Ute Karl  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2581003	<a href="#">Energy and Environment</a>	2 SWS	Lecture (V)	Karl
SS 2019	2581004	<a href="#">Übungen zu Energie und Umwelt</a>	1 SWS	Practice (Ü)	Seddig, Keles
Exams					
SS 2019	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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

The focus of the lecture is put on environmental impacts of fossil fuel conversion and related assessment methods. The list of topics is given below.

- Fundamentals of energy conversion
- Air pollutant formation from fossil fuel combustion
- Control of air pollutant emissions from fossil-fuelled power plants.
- Measures to improve conversion efficiency of fossil fuelled power plants.
- External effects of energy supply (Life Cycle Assessment of selected energy systems)
- Integrated Assessment models supporting the European Thematic Strategy on Air
- Cost-effectiveness analyses and cost-benefit analyses of air pollution control measures
- Monetary evaluation of external effects of energy supply (external costs)

**Workload**

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

**Literature**

The references for further reading are included in the lecture documents (see ILIAS)

## T

**6.106 Course: Energy Market Engineering [T-WIWI-107501]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2540464	<a href="#">Energy Market Engineering</a>	2 SWS	Lecture (V)	Weinhardt, Staudt
SS 2019	2540465	<a href="#">Übung zu Energy Market Engineering</a>	1 SWS	Practice (Ü)	Staudt, vom Scheidt
Exams					
SS 2019	79852	<a href="#">Energy Market Engineering</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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

This lecture discusses different design options for electricity markets. We will focus on different approaches of nodal and zonal pricing as well as single price mechanisms and capacity markets. After a short recap of German and European market designs, the different design options will be discussed scientifically and with the help of examples. Furthermore, we will evaluate alternative market design options like microgrids. Besides the fundamental functioning of those markets, we will introduce and discuss methodological knowledge to evaluate market design options.

**Annotation**

The lecture has also been added in the IIP Module *Basics of Liberalised Energy Markets*.

**Workload**

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

**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.
- Stoft 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

**6.107 Course: Energy Networks and Regulation [T-WIWI-107503]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**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)

**Learning Content**

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
- 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.

**Workload**

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

**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

**6.108 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 2019	2581959	<a href="#">Energy Policy</a>	2 SWS	Lecture (V)	Wietschel
Exams					
SS 2019	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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

The course deals with material and energy policy of policy makers and includes the effects of such policies on the economy as well as the involvement of industrial and other stakeholders in the policy design. At the beginning the neoclassical environment policy is discussed. Afterwards the Sustainable Development concept is presented and strategies how to translate the concept in policy decision follows. In the next part of the course an overview about the different environmental instruments classes, evaluation criteria for these instruments and examples of environmental instruments like taxes or certificates will be discussed. The final part deals with implementation strategies of material and energy policy.

**Learning Content**

The course deals with material and energy policy of policy makers and includes the effects of such policies on the economy as well as the involvement of industrial and other stakeholders in the policy design. At the beginning the neoclassical environment policy is discussed. Afterwards the Sustainable Development concept is presented and strategies how to translate the concept in policy decision follows. In the next part of the course an overview about the different environmental instruments classes, evaluation criteria for these instruments and examples of environmental instruments like taxes or certificates will be discussed. The final part deals with implementation strategies of material and energy policy.

**Workload**

The total workload for this course is approximately 105.0 hours. For further information see German version.

**Literature**

Will be announced in the lecture.

## T

**6.109 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)**

**Learning 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

**Annotation**

Since 2011 the lecture is offered in winter term. Exams can still be taken in summer term.

**Workload**

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

## T

**6.110 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101451 - Energy Economics and Energy Markets](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2019	2581020	<a href="#">Energy Trade and Risk Management</a>	3 SWS	Lecture (V)	Keles, Cremer
Exams					
SS 2019	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 2019, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

1. Introduction to Markets, Mechanisms, Interactions
2. Basics of Risk Management
3. Oil Markets
4. Gas Markets
5. Coal Markets
6. Emission Markets
7. Simulation Game
8. Power Markets
9. Risk Management in Utilities

**Annotation**

The credits have been changed from 3.5 to 4.

**Workload**

The total workload for this course is approximately 120.0 hours. For further information see German version.

**Literature****Elective literature:**

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

**6.111 Course: Engineering FinTech Solutions [T-WIWI-106193]****Responsible:** Prof. Dr Maxim Ulrich**Organisation:** KIT Department of Economics and Management

**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103247 - Intelligent Risk and Investment Advisory](#)  
[M-WIWI-103261 - Disruptive FinTech Innovations](#)  
[M-WIWI-105036 - FinTech Innovations](#)

**Type**  
Examination of another type

**Credits**  
9

**Recurrence**  
Each term

**Version**  
4

Events					
WS 19/20	2500020	<a href="#">Engineering FinTech Solutions</a>	6 SWS	Practical course (P)	Ulrich
Exams					
SS 2019	7900125	<a href="#">Engineering FinTech Solutions</a>		Prüfung (PR)	Ulrich
SS 2019	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)****Description**

This project invites students to either pursue their own FinTech innovation project or to contribute to the Chair's ongoing innovation projects.

**Learning Content**

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.

**Workload**

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.

**T****6.112 Course: Entrepreneurial Leadership & Innovation Management [T-WIWI-102833]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**6.113 Course: Entrepreneurship [T-WIWI-102864]**

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	2545001	<a href="#">Entrepreneurship</a>	2 SWS	Lecture (V)	Terzidis, Mitarbeiter
Exams					
SS 2019	7900002	<a href="#">Entrepreneurship</a>		Prüfung (PR)	Terzidis
SS 2019	7900192	<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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Description**

This lecture, as an obligatory part of the module "Entrepreneurship", introduces basic concepts of entrepreneurship. It approaches the individual steps of dynamic corporate development. The focus here is the introduction to methods for generating innovative business ideas, the translation of patents into business concepts and general principles of business planning.

Other topics are the design and use of service-oriented information systems for founders, technology management, business model generation and lean startup methods for the implementation of business ideas in the way of controlled experiments in the market.

**Learning Content**

This lecture, as an obligatory part of the module "Entrepreneurship", introduces basic concepts of entrepreneurship. It approaches the individual steps of dynamic corporate development. The focus here is the introduction to methods for generating innovative business ideas, the translation of patents into business concepts and general principles of financial planning.

Other topics are the design and use of service-oriented information systems for founders, technology management, business model generation and lean startup methods for the implementation of business ideas in the way of controlled experiments in the market.

**Workload**

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



## 6.114 Course: Entrepreneurship Research [T-WIWI-102894]

**Responsible:** Prof. Dr. Orestis Terzidis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2545002	<a href="#">Entrepreneurship Research</a>	2 SWS	Seminar (S)	Avila Albez, Terzidis, Tittel
Exams					
SS 2019	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:*



## Entrepreneurship Research

2545002, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

### Learning Content

Content of the seminar is most recently discussed topics in the field of entrepreneurship. Topics and dates will be communicated online via the seminar portal.

### Annotation

The topics are prepared in small groups. The seminar consists of two attendance meetings (kick-off event and final presentation). Between the appointments, independent work is required. The results will be presented at the end of the semester. There is an obligation to attend all seminars.

### Workload

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

### Literature

Will be announced during/prior to the seminar as this varies from topic to topic.



**T****6.115 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**  
Written examination

**Credits**  
4

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	2560548	<a href="#">Environmental and Ressource Policy</a>	2 SWS	Lecture / Practice (VÜ)	Walz
Exams					
SS 2019	7900277	<a href="#">Environmental and Resource Policy</a>		Prüfung (PR)	Mitusch

**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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Workload**

The total workload for this course is approximately 120 hours. For further information see German version.

**Literature****Elective literature:**

Michaelis, P.: *Ökonomische Instrumente in der Umweltpolitik. Eine anwendungsorientierte Einführung*, Heidelberg  
 OECD: *Environmental Performance Review Germany*, Paris

## T

**6.116 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					
SS 2019	7900273	<a href="#">Environmental Economics and Sustainability</a>	Prüfung (PR)		Mitusch

**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

## 6.117 Course: Environmental Law [T-INFO-101348]

**Responsible:** Prof. Dr. Matthias Bäcker  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)  
[M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101468 - Environmental Economics](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
WS 19/20	24140	<a href="#">Umweltrecht</a>	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500082	<a href="#">Environmental Law</a>		Prüfung (PR)	Marsch

## T

## 6.118 Course: European and International Law [T-INFO-101312]

**Responsible:** Ulf Brühann

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101217 - Public Business Law](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	24666	<a href="#">Europäisches und Internationales Recht</a>	2 SWS	Lecture (V)	Brühann
Exams					
SS 2019	7500084	<a href="#">European and International Law</a>		Prüfung (PR)	Marsch

## T

**6.119 Course: Experimental Economics [T-WIWI-102614]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900104	<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)**

**Learning Content**

Experimental Economics have become a separate field in Economics. Nearly all fields of the economic discipline use economic experiments to verify theoretical results. Besides being used for empirical validation, this method is applied in political and strategic consulting. The lecture gives an introduction to experimental methods in economics and shows differences to experiments in natural sciences. Scientific studies are used to show exemplary applications.

**Workload**

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

**Literature**

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 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

## 6.120 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".

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### Prerequisites

None

### Annotation

The pupose of this placeholder is to make it possible zu 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****6.121 Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]****Responsible:** Prof. Dr. Stefan Nickel**Organisation:** KIT Department of Economics and Management**Part of:** [M-INFO-102233 - Further Examinations](#)[M-WIWI-102832 - Operations Research in Supply Chain Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	4

Exams				
SS 2019	7900233	<a href="#">Facility Location and Strategic Supply Chain Management</a>	Prüfung (PR)	Nickel

**Competence Certificate**

Due to a research semester of Professor Nickel in WS 19/20, the course "Facility Location and Strategic Supply Chain Management" does NOT take place in WS 19/20. In particular, neither WS 19/20 nor SS 20 will offer an exam for the lecture. The follow-up exam to the lecture in WS 18/19 takes place in SS 19 and is exclusively for students in the second examination.

The assessment consists of a written exam (60 min) according to Section 4 (2), 1 of the examination regulation.

The exam takes place in every semester.

Prerequisite for admission to examination is the successful completion of the online assessments.

**Prerequisites**

Prerequisite for admission to examination is the successful completion of the online assessments.

**Recommendation**

None

**Annotation**

The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

## T

**6.122 Course: Financial Analysis [T-WIWI-102900]**

**Responsible:** Dr. Torsten Luedecke  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2019	2530205	<a href="#">Financial Analysis</a>	2 SWS	Lecture (V)	Luedecke
SS 2019	2530206	<a href="#">Übungen zu Financial Analysis</a>	2 SWS	Practice (Ü)	Luedecke
Exams					
SS 2019	7900075	<a href="#">Financial Analysis</a>		Prüfung (PR)	Luedecke

**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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Description**

This lecture reviews the key financial statements according to international financial reporting standards and provides analytical tools to evaluate the income statement, the balance sheet, and the cash flow statement in order to measure a firm's liquidity, operational efficiency, and profitability.

**Learning Content**

Topics:

- Introduction to Financial Analysis
- Financial Reporting Standards
- Major Financial Statements and Other Information
- Recognition and Measurement Issues
- Analysis of Financial Statements
- Financial Reporting Quality

**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

**6.123 Course: Financial Econometrics [T-WIWI-103064]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101638 - Econometrics and Statistics I](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

**Competence Certificate**

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

**Prerequisites**

None

**Recommendation**

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

**Annotation**

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

## T

**6.124 Course: Financial Intermediation [T-WIWI-102623]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900078	<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)**

**Description**

- Arguments for the existence of financial intermediaries
- Bank loan analysis, relationship lending
- Competition in the banking sector
- Stability of the financial system
- The macroeconomic role of financial intermediation

**Learning Content**

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

**Workload**

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

**Literature****Elective literature:**

- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6th edition, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2nd edition, MIT Press.

**T****6.125 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		2 SWS	Seminar (S)	Ntagiakou, Kienzle

**Competence Certificate**

Alternative exam assessment. The grade consists of the presentation and the written elaboration.

**Prerequisites**

None

## T

**6.126 Course: Fixed Income Securities [T-WIWI-102644]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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>	2 SWS	Lecture (V)	Uhrig-Homburg, Mitarbeiter
Exams					
SS 2019	7900112	<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, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

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.

**Learning 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.

**Workload**

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

**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).

**Elective literature:**

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

## T

## 6.127 Course: Formal Systems [T-INFO-101336]

**Responsible:** Prof. Dr. Bernhard Beckert  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100799 - Formal Systems](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24086	<a href="#">Formale Systeme</a>	4 SWS	Lecture / Practice (VÜ)	Beckert, Ulbrich
Exams					
SS 2019	7500009	<a href="#">Formal Systems</a>		Prüfung (PR)	Beckert
WS 19/20	7500036	<a href="#">Formal Systems</a>		Prüfung (PR)	Beckert

## T

## 6.128 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2019	2400093	<a href="#">Formal Systems II: Application</a>	3 SWS	Lecture (V)	Ulbrich, Beckert
Exams					
SS 2019	7500006	<a href="#">Formale Systeme II: Anwendung</a>		Prüfung (PR)	Beckert

**T****6.129 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1



## T

## 6.130 Course: Geometric Optimzation [T-INFO-101267]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-100730 - Geometric Optimization](#)  
[M-INFO-101214 - Algorithms in Computer Graphics](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Exams				
SS 2019	7500230	<a href="#">Geometric Optimzation</a>	Prüfung (PR)	Prautzsch

## T

## 6.131 Course: Global Optimization I [T-WIWI-102726]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2019	2550134	<a href="#">Globale Optimierung I</a>	2 SWS	Lecture (V)	Stein
SS 2019	2550135	<a href="#">Übungen zu Globale Optimierung I+II</a>	1 SWS	Practice (Ü)	Stein
Exams					
SS 2019	7900061_SS2019_HK	<a href="#">Global Optimization I</a>		Prüfung (PR)	Stein

**Competence Certificate**

Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO) and possibly of a compulsory prerequisite.

The exam is offered in the lecture of semester and the following semester.

The success check can be done also with the success control for "Global optimization II". In this case, the duration of the written exam is 120 min.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

Part I and II of the lecture are held consecutively in the *same* semester.

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

## V

## Globale Optimierung I

2550134, SS 2019, 2 SWS, [Open in study portal](#)

Lecture (V)

**Learning Content**

In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

Part I of the lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Numerical methods

Nonconvex optimization problems are treated in part II of the lecture.

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**Literature**

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990



## 6.132 Course: Global Optimization I and II [T-WIWI-103638]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

Events					
SS 2019	2550134	<a href="#">Globale Optimierung I</a>	2 SWS	Lecture (V)	Stein
SS 2019	2550136	<a href="#">Globale Optimierung II</a>	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900063_SS2019_HK	<a href="#">Global Optimization I and II</a>		Prüfung (PR)	Stein

### Competence Certificate

The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The examination is held in the semester of the lecture and in the following semester.

### Prerequisites

None

### Recommendation

None

### Annotation

Part I and II of the lecture are held consecutively in the *same* semester.

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



### Globale Optimierung I

2550134, SS 2019, 2 SWS, [Open in study portal](#)

Lecture (V)

### Learning Content

In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

Part I of the lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology
- Existence results
- Optimality in convex optimization
- Duality, bounds, and constraint qualifications
- Numerical methods

Nonconvex optimization problems are treated in part II of the lecture.

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

## Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

### V

## Globale Optimierung II

2550136, SS 2019, 2 SWS, [Open in study portal](#)

Lecture (V)

## Learning Content

In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The global solution of convex optimization problems is subject of part I of the lecture.

Part II of the lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via aBB method
- Branch and bound methods
- Lipschitz optimization

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

## Literature

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

## T

## 6.133 Course: Global Optimization II [T-WIWI-102727]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2550135	<a href="#">Übungen zu Globale Optimierung I+II</a>	1 SWS	Practice (Ü)	Stein
SS 2019	2550136	<a href="#">Globale Optimierung II</a>	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900062_SS2019_HK	<a href="#">Global Optimization II</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 and possibly of a compulsory prerequisite.

The examination is held in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of "Global optimization I". In this case, the duration of the written examination takes 120 minutes.

**Prerequisites**

None

**Annotation**

Part I and II of the lecture are held consecutively in the *same* semester.

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

## V

**Globale Optimierung II**

2550136, SS 2019, 2 SWS, [Open in study portal](#)

Lecture (V)

**Learning Content**

In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.

The global solution of convex optimization problems is subject of part I of the lecture.

Part II of the lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples
- Convex relaxation
- Interval arithmetic
- Convex relaxation via aBB method
- Branch and bound methods
- Lipschitz optimization

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**Literature**

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004
- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000
- R. Horst, H. Tuy *Global Optimization* Springer 1996
- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

## T

**6.134 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-INFO-102233 - Further Examinations](#)  
[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

**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

## 6.135 Course: Heat Economy [T-WIWI-102695]

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101452 - Energy Economics and Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Exams				
SS 2019	7981001	<a href="#">Heat Economy</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.

**Recommendation**

None

**Annotation**

See German version.

## T

**6.136 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-104520 - Human Factors in Security and Privacy](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	2

Exams				
SS 2019	7900084	<a href="#">Human Factors in Security and Privacy</a>	Prüfung (PR)	Volkamer
WS 19/20	7900113	<a href="#">Human Factors in Security and Privacy</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

## 6.137 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each summer term

**Version**  
2

Events					
SS 2019	24659	<a href="#">Human-Computer-Interaction</a>	2 SWS	Lecture (V)	Beigl, Exler
Exams					
SS 2019	7500048	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl
WS 19/20	7500076	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl

## T

## 6.138 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Completed coursework	0	Each summer term	1

Events					
SS 2019	2400095	<a href="#">Human-Computer-Interaction</a>	1 SWS	Practice (Ü)	Beigl, Exler
SS 2019	24659	<a href="#">Human-Computer-Interaction</a>	2 SWS	Lecture (V)	Beigl, Exler
Exams					
SS 2019	7500121	<a href="#">Human-Machine-Interaction</a>		Prüfung (PR)	Beigl

## T

## 6.139 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-101238 - Automated visual inspection](#)  
[M-INFO-101239 - Machine Vision](#)  
[M-INFO-101241 - Image-based detection and classification](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500002	<a href="#">Image Data Compression</a>		Prüfung (PR)	Beyerer
WS 19/20	7500013	<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)

### Learning 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).

## T

## 6.140 Course: Incentives in Organizations [T-WIWI-105781]

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2573003	<a href="#">Incentives in Organizations</a>	2 SWS	Lecture (V)	Nieken
SS 2019	2573004	<a href="#">Übung zu Incentives in Organizations</a>	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
SS 2019	7900132	<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.

**Annotation**

The course is carried out routinely in summer.

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

## V

**Incentives in Organizations**

2573003, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Notes**

See Module Handbook

## T

**6.141 Course: Industrial Services [T-WIWI-102822]**

**Responsible:** Prof. Dr. Hansjörg Fromm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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	Each winter term	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					
SS 2019	7900219	<a href="#">Industrial Services</a>		Prüfung (PR)	Fromm

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**

None

**Recommendation**

None

*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)**

**Learning 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
- Service Levels – Definitions, Agreements, Measurements and Service Level Engineering
- 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-Add Services – Industrial Service Innovation

**Workload**

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

**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

## 6.142 Course: Information Service Engineering [T-WIWI-106423]

**Responsible:** Prof. Dr. Harald Sack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101456 - Intelligent Systems and Services](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2511606	<a href="#">Information Service Engineering</a>	2 SWS	Lecture (V)	Sack
SS 2019	2511607	<a href="#">Übungen zu Information Service Engineering</a>	1 SWS	Practice (Ü)	Sack
Exams					
SS 2019	7900070	<a href="#">Information Service Engineering</a>		Prüfung (PR)	Sack
WS 19/20	7900071	<a href="#">Information Service Engineering</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

**Annotation**

New course starting summer term 2017.

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

## V

**Information Service Engineering**

2511606, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning 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

**- Linked Data Engineering**

- Knowledge Representations and Ontologies
- What's in an URI?
- Resource Description Framework (RDF)
- Creating new Models with RDFS
- Querying RDF(S) with SPARQL
- More Expressivity with Web Ontology Language (OWL)
- The Web of Data
- Vocabularies and Ontologies in the Web of Data
- Wikipedia, DBpedia, and Wikidata

**- Information Retrieval**

- Information Retrieval Models
- Retrieval Evaluation
- Web Information Retrieval
- Document Crawling, Text Processing, and Indexing
- Query Processing and Result Representation
- Question Answering

**- Knowledge Mining**

- From Data to Knowledge
- Data Mining
- Machine Learning Basics for Knowledge Mining
- Mining Knowledge from Wikipedia
- Named Entity Resolution

**- Exploratory Search and Recommender Systems**

- Semantic Search and Entity Centric Search
- Collaborative Filtering and Content Based Recommendations
- From Search to Intelligent Browsing
- Linked Data Based Exploratory Search
- Fact Ranking

**Annotation**

New lecture, since summer semester 2017

**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.#

**T****6.143 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	2545100	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>	2 SWS	Lecture (V)	Weissenberger-Eibl
Exams					
SS 2019	7900144	<a href="#">Innovation Management: Concepts, Strategies and Methods</a>		Prüfung (PR)	Weissenberger-Eibl
SS 2019	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) (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****Innovation Management: Concepts, Strategies and Methods**

2545100, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Notes**

The lecture will be held in German.

**Learning 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.

**Annotation**

This course was formerly named "Innovation Management".

**Workload**

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

**Literature**

A detailed bibliography is provided with the lecture notes.

## T

## 6.144 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

**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

**6.145 Course: Innovationtheory 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 2019	2560236	<a href="#">Innovationtheory and -policy</a>	SWS	Lecture (V)	Ott
SS 2019	2560237	<a href="#">Übung zu Innovationstheorie und -politik</a>	SWS	Practice (Ü)	Ott, Eraydin
Exams					
SS 2019	7900107	<a href="#">Innovationtheory and -Policy</a>		Prüfung (PR)	Ott

**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.

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

## V

**Innovationtheory and -policy**

2560236, SS 2019, SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

- Incentives for the emergence of innovations
- Patents
- Diffusion
- Impact of technological progress
- Innovation Policy

**Workload**

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

**Literature**

Excerpt:

- 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

## 6.146 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2019	2400004	<a href="#">Integrated Network and Systems Management</a>	2 SWS	Lecture (V)	Neumair
Exams					
SS 2019	7500144	<a href="#">Integrated Network and Systems Management</a>	Prüfung (PR)		Neumair

## T

**6.147 Course: Intelligent CRM Architectures [T-WIWI-103549]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900280	<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)**

**Learning 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**

**Literature**

- P. Clements *et al.*, *Documenting Software Architectures. Views and Beyond*. Upper Saddle River: Addison-Wesley, 2011.
- M. Fowler, *Patterns of Enterprise Application Architecture*. Amsterdam: Addison-Wesley Longman, 2002.
- S. Russell and P. Norvig, *Artificial Intelligence: A Modern Approach*, 3rd ed. Harlow Essex England: Pearson New International Edition, 2014.
- V. N. Vapnik, *The Nature of Statistical Learning Theory*. New York: Springer, 1995.

## T

**6.148 Course: Interactive Information Systems [T-WIWI-108461]**

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

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

**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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	3

Events					
SS 2019	2540558	<a href="#">Interactive Systems</a>	3 SWS	Lecture (V)	Mädche, Morana
Exams					
SS 2019	791000002	<a href="#">Interactive Systems</a>		Prüfung (PR)	Mädche

**Competence Certificate**

The assessment consists of a written exam of 1 hour and by submitting written papers as part of the exercise.  
Details will be announced at the beginning of the course.

**Prerequisites**

None

**Annotation**

This course replaces T-WIWI-106342 "Interactive Systems" starting summer term 2018.  
The course is held in english.

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

## V

**Interactive Systems**

2540558, SS 2019, 3 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Description**

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. The aim of this course is to introduce the foundations, theoretical grounding, key concepts and principles as well as current practice of interactive systems. The contents of the course abstract from the technical implementation details. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

**Notes**

The lecture is complemented with a capstone project assignment, where students analyze and review existing interactive systems and suggest areas of improvement / extensions.

**Learning Content**

- Basics
- Theoretical foundations
- Key concepts and design principles for specific interactive systems classes
- Capstone project

### **Literature**

The lecture bases to a large extend on

- Benyon, D. (2014). Designing interactive systems: A comprehensive guide to HCI, UX and interaction design (3. ed.). Harlow: Pearson.

Additional literature will be provided in the lecture.

## T

**6.149 Course: International Finance [T-WIWI-102646]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101480 - Finance 3](#)  
[M-WIWI-101483 - Finance 2](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	2530570	<a href="#">International Finance</a>	2 SWS	Lecture (V)	Walter, Uhrig-Homburg
Exams					
SS 2019	7900097	<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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Description**

The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

**Learning Content**

The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

**Workload**

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

**Literature****Elective literature:**

- Eiteman, D. et al., Multinational Business Finance, 13. edition, 2012.
- Solnik, B. and D. McLeavey, Global Investments, 6. edition, 2008.

**T****6.150 Course: International Management in Engineering and Production [T-WIWI-102882]**

**Responsible:** Dr. Henning Sasse  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)****Learning 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

**Workload**

The total workload for this course is approximately 105 hours. For further information see German version.

**Literature**

Will be announced in the course.

## T

**6.151 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-101487 - Sales Management](#)  
[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

**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)****Notes**

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".

**Annotation**

- 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.

**Workload**

Total workload for 3 ECTS: about 90 hours

## T

## 6.152 Course: Internet Law [T-INFO-101307]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each winter term

**Version**  
2

Events					
WS 19/20	24354	<a href="#">Internet Law</a>	2 SWS	Lecture (V)	Dreier
Exams					
SS 2019	7500057	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500060	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.153 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
4

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24104	<a href="#">Internet of Everything</a>	2 SWS	Lecture (V)	Friebe, Jung, Zitterbart
Exams					
SS 2019	7500071	<a href="#">Internet of Everything</a>		Prüfung (PR)	Zitterbart
WS 19/20	7500009	<a href="#">Internet of Everything</a>		Prüfung (PR)	Zitterbart



## T

## 6.154 Course: Introduction in Computer Networks [T-INFO-102015]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101178 - Communication and Database Systems](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2019	24519	<a href="#">Einführung in Rechnernetze</a>	2 SWS	Lecture (V)	Friebe, Gerhard, Jung, Zitterbart
SS 2019	24521	<a href="#">Übung zu Einführung in Rechnernetze</a>	1 SWS	Practice (Ü)	Friebe, Gerhard, Jung, Zitterbart
Exams					
SS 2019	7500116	<a href="#">Introduction to Computer Networking</a>		Prüfung (PR)	Zitterbart

## T

**6.155 Course: Introduction to Stochastic Optimization [T-WIWI-106546]**

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2550470	<a href="#">Einführung in die Stochastische Optimierung</a>	2 SWS	Lecture (V)	Rebennack
SS 2019	2550471	<a href="#">Übung zur Einführung in die Stochastische Optimierung</a>	1 SWS	Practice (Ü)	Rebennack, Assistenten
Exams					
SS 2019	7900198	<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

## 6.156 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](#)  
[M-INFO-101241 - Image-based detection and classification](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2019	24684	<a href="#">Introduction to Video Analysis</a>	2 SWS	Lecture (V)	Arens
Exams					
SS 2019	7500031	<a href="#">Introduction to Video Analysis</a>		Prüfung (PR)	Beyerer, Arens
WS 19/20	7500099	<a href="#">Introduction to Video Analysis</a>		Prüfung (PR)	Beyerer, Arens

**T****6.157 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

## T

## 6.158 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101458 - Ubiquitous Computing](#)

**Type**  
Oral examination

**Credits**  
5

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24149	<a href="#">IT-Security Management for Networked Systems</a>	3 SWS	Lecture / Practice (VÜ)	Hartenstein, Grashöfer, Neudecker
Exams					
SS 2019	7500599	<a href="#">IT-Security Management for Networked Systems</a>		Prüfung (PR)	Hartenstein

## T

**6.159 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 2019	2545021	<a href="#">Joint Entrepreneurship School</a>	SWS	Seminar (S)	Terzidis, Ntagiakou
Exams					
SS 2019	7900228	<a href="#">Joint Entrepreneurship School 2019</a>		Prüfung (PR)	Terzidis

**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

## 6.160 Course: Knowledge Discovery [T-WIWI-102666]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101456 - Intelligent Systems and Services](#)  
[M-WIWI-102827 - Service Computing](#)

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					
SS 2019	7900039	<a href="#">Knowledge Discovery</a>		Prüfung (PR)	Sure-Vetter
WS 19/20	7900013	<a href="#">Knowledge Discovery</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)

**Notes**

The lecture provides an overview of machine learning and data mining techniques for knowledge discovery from large data sets. These techniques are examined in respect of algorithms, applicability to different data representations and application in the real world.

Knowledge discovery is a well-established field with a large community investigating methods for the discovery of patterns and regularities in large data sets, including relational databases and unstructured text.

A variety of methods are available to assist in extracting patterns that, if interpreted, provide valuable, possibly previously unknown, insights. This information can be predictive or descriptive in nature.

This lecture provides an overview of this field. The lecture imparts specific techniques and methods, challenges and current and future research work in this field.

Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empirical evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others feature vector-based learning, text mining and social network analysis.

**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

**Exercises to Knowledge Discovery**

2511303, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Notes**

The exercises are related to the lecture Knowledge Discovery.

Multiple exercises are held that capture the topics, held in the lecture Knowledge Discovery, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empirical evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others feature vector-based learning, text mining and social network analysis.

**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.



**T****6.161 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-102233 - Further Examinations](#)[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)****Annotation**

We recommend to attend the course "Sprachverarbeitung in der Softwaretechnik".

**Workload**

150h

**Literature**

Needed literature will be given in the lab.

## T

## 6.162 Course: Lab: Graph Visualization in Practice [T-INFO-106580]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-INFO-103302 - Lab: Graph Visualization in Practice](#)

Type	Credits	Recurrence	Version
Examination of another type	5	Irregular	1

Events					
SS 2019	2400037	<a href="#">Graph Visualization in Practice</a>	2 SWS	Practical course (P)	Wagner, Mtsentlintze, Radermacher
Exams					
SS 2019	7500136	<a href="#">Lab: Graph Visualization in Practice</a>		Prüfung (PR)	Wagner

**T****6.163 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](#)  
[M-INFO-102233 - Further Examinations](#)

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

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)**

**Workload**  
150 h

## T

**6.164 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	8	Each summer term	1

Events					
SS 2019	24661	<a href="#">Language Technology and Compiler</a>	4 SWS	Lecture (V)	Snelting
Exams					
SS 2019	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 2019, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

Structure of a compiler

Lexical analysis

Syntactic analysis

Semantic analysis

Code generation

Program Analysis

Security Analysis

Code optimization

Foundations of software security analysis

Specific technologies: LL parsing, LR/LALR parsing, attributed grammars, instruction selection, register allocation, runtime mechanisms, memory management, static single assignment form and its usage in optimization, data flow techniques, information flow control, garbage collection.

**Workload**

approx. 270 h

## T

## 6.165 Course: Large-scale Optimization [T-WIWI-106549]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

Events					
SS 2019	2550475	<a href="#">Large-Scale Optimization</a>	2 SWS	Lecture (V)	Rebennack
SS 2019	2550476	<a href="#">Übung zu Large-Scale Optimization</a>	1 SWS	Practice (Ü)	Rebennack, Assistenten
Exams					
SS 2019	7900197	<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

**6.166 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	24671	<a href="#">Law of Contracts</a>	2 SWS	Lecture (V)	Hoff
Exams					
SS 2019	7500055	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500059	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz

## T

**6.167 Course: Liberalised Power Markets [T-WIWI-107043]**

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900253	<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**

See German version.

**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)

**Learning Content**

1. The European liberalisation process
  - 1.1 The concept of a competitive market
  - 1.2 The regulated market
  - 1.3 Deregulation in Europe
2. Pricing and investments in a liberalised power market
  - 2.1 Merit order
  - 2.2 Prices and investments
  - 2.3 Market flaws and market failure
  - 2.4 Regulation in liberalised markets
  - 2.5 Additional regulation mechanisms
3. The power market and the corresponding submarkets
  - 3.1 List of submarkets
  - 3.2 Types of submarkets
  - 3.3 Market rules
4. Risk management
  - 4.1 Uncertainties in a liberalised market
  - 4.2 Investment decisions under uncertainty
  - 4.3 Estimating future electricity prices
  - 4.4 Portfolio management
5. Market power
  - 5.1 Defining market power
  - 5.2 Indicators of market power
  - 5.3 Reducing market power
6. Market structures in the value chain of the power sector

**Annotation**

The course "Basics of Liberalised Energy Markets" [2581998] will be reduced to 3 credits in winter term 2015/2016 and the tutorial [2581999] is no longer offered.

**Workload**

The total workload for this course is approximately 105.0 hours. For further information see German version.

**Literature****Elective literature:**

Power System Economics; Steven Stoft, IEEE Press/Wiley-Interscience Press, 0-471-15040-1



## T

**6.168 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

**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)**

**Learning Content**

Our society has reached a historically unique material prosperity. At the same time, environmental burdens and resource consumption are continuously reaching new peaks - not only regarding greenhouse gas emissions and oil production rates. It is obvious that the material and energy intensity of products and services has to decrease if we want to keep our current level of material prosperity on the long run. Enormous efficiency gains, as they have been reached e.g. for labour productivity, however, require that environmental burdens and resource consumption per unit of product are in the first place known, transparent and can thus be optimised. This data and its calculation are increasingly requested and sooner or later will have to become as essential for management as e.g. unit labour costs.

Life cycle assessment is a methodology in sustainability assessment that provides this information and deduces optimisation potentials and decision support for companies, politics, consumers etc. To this end, material and energy flows are compiled along the whole life cycle of a product from extraction of raw materials, via production and use of a product until its disposal. Subsequently, environmental impacts of these flows are analysed.

This lecture describes structure and individual steps of life cycle assessments in detail. Furthermore, it explains its application in decision support. In interactive phases, participants recapitulate the theoretical basis by own calculations. As an outlook, further instruments in sustainability assessment are introduced that analyse other sustainability aspects.

**Workload**

Total effort required will account for approximately 105h (3.5 credits).

**Literature**

will be announced in the course

## T

**6.169 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900154	<a href="#">Machine Learning 1 - Basic Methods</a>		Prüfung (PR)	Zöllner
WS 19/20	7900076	<a href="#">Machine Learning 1 - Basic Methods</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)

**Notes**

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.

## T

**6.170 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-INFO-102233 - Further Examinations](#)  
[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 2019	2511502	<a href="#">Machine Learning 2 - Advanced methods</a>	2 SWS	Lecture (V)	Zöllner
SS 2019	2511503	<a href="#">Exercises for Machine Learning 2 - Advanced Methods</a>	1 SWS	Practice (Ü)	Zöllner
Exams					
SS 2019	7900080	<a href="#">Machine Learning 2 – Advanced Methods</a>		Prüfung (PR)	Zöllner
WS 19/20	7900050	<a href="#">Machine Learning 2 – Advanced Methods</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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Description**

The field of machine decision-making and inference procedures, taking into account uncertainties and incomplete knowledge, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.

The focus of this lecture is on the embedding and application of machine-learning methods in decision and inference systems starting with methods of dimension reduction, feature selection/evaluation via semi-supervised learning to methods of probabilistic inference (e.g. Dempster Shafer information fusion, dynamic and object-oriented Bayesian networks, POMDP, etc).

The lecture introduces the basic principles and structures and explains algorithms developed so far. The structure and operation of the procedures and methods are presented and explained using a number of application scenarios, in particular from the field of technical (semi-)autonomous systems.

**Notes**

The first exercise will take place on 08.05.2019.

**Learning 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.).

**Literature**

The slides are available as a PDF

**Related Literature**

- 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

Further (specific) literature on individual topics will be given in the lecture.

**Exercises for Machine Learning 2 - Advanced Methods**

2511503, SS 2019, 1 SWS, [Open in study portal](#)

Practice (Ü)

**Notes**

The first exercise will take place on 08.05.2019.



## 6.171 Course: Management Accounting 1 [T-WIWI-102800]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101498 - Management Accounting](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2579900	<a href="#">Management Accounting 1</a>	2 SWS	Lecture (V)	Wouters
SS 2019	2579901	<a href="#">Übung zu Management Accounting 1</a>	2 SWS	Practice (Ü)	Riar
Exams					
SS 2019	79-2579900-00	<a href="#">Management Accounting 1</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579900-00	<a href="#">Management Accounting 1</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:*



## Management Accounting 1

2579900, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Notes

see Module Handbook

### Learning 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.

### 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

2579901, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

#### Notes

see Module Handbook

## T

**6.172 Course: Management Accounting 2 [T-WIWI-102801]**

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	79-2579902-00	<a href="#">Management Accounting 2</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579903-00	<a href="#">Management Accounting 2</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation) 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)**

**Notes**

see Module Handbook

**Learning 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 and customer value propositions.

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.

**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.

**V**2579904, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Notes**

see Module Handbook

**V**2579905, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Notes**

see Module Handbook



## T

**6.173 Course: Management of IT-Projects [T-WIWI-102667]**

**Responsible:** Dr. Roland Schätzle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	3

Events					
SS 2019	2511214	<a href="#">Management of IT-Projects</a>	2 SWS	Lecture (V)	Schätzle
SS 2019	2511215	<a href="#">Übungen zu Management von Informatik-Projekten</a>	1 SWS	Practice (Ü)	Schätzle
Exams					
SS 2019	7900045	<a href="#">Management of IT-Projects</a>		Prüfung (PR)	Oberweis
WS 19/20	7900014	<a href="#">Management of IT-Projects</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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning 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.

**Workload**

Lecture 30h

Exercise 15h

Preparation of lecture 30h

Preparation of exercises 30h

Exam preparation 44h

Exam & 1h

Total: 150h

**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.

Further literature is given in each lecture individually.



## 6.174 Course: Managing New Technologies [T-WIWI-102612]

**Responsible:** Dr. Thomas Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101488 - Entrepreneurship \(EnTechnon\)](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2019	2545003	<a href="#">Managing New Technologies</a>	2 SWS	Lecture (V)	Reiß
Exams					
SS 2019	7900257	<a href="#">Managing New Technologies</a>		Prüfung (PR)	Terzidis

### 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:*



## Managing New Technologies

2545003, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Learning Content

The course provides an overview of the international development of a selected number of key technologies such as biotechnology, nanotechnology, neurotechnologies, converging technologies. Methods for monitoring new technologies including foresight approaches will be presented and the economic and social impacts of new technologies will be discussed.

### Workload

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

### Literature

- Hausschildt/Salomo: Innovationsmanagement; Borchert et al.: Innovations- und Technologiemanagement;
- Specht/Möhrle; Gabler Lexikon Technologiemanagement

## T

**6.175 Course: Market Engineering: Information in Institutions [T-WIWI-102640]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2540460	<a href="#">Market Engineering: Information in Institutions</a>	2 SWS	Lecture (V)	Weinhardt, Straub
SS 2019	2540461	<a href="#">Übungen zu Market Engineering: Information in Institutions</a>	1 SWS	Practice (Ü)	Weinhardt
Exams					
SS 2019	7910804	<a href="#">Market Engineering: Information in Institutions</a>		Prüfung (PR)	Weinhardt
SS 2019	7979235	<a href="#">Market Engineering: Information in Institutions</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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Description**

The ongoing advancements in information technology have revolutionized traditional business processes and given rise to electronic marketplaces. In contrast to physical marketplaces, electronic markets do not just evolve, but must be carefully designed, implemented and monitored and evaluated. Moreover electronic markets demand open and flexible platforms as well as adequate standards and information services. Future Market Engineers must therefore be able to consider the economic, legal and technological dimension of markets simultaneously. The lecture focuses on the discussion of (1) Microstructure, (2) IT Infrastructure, and (3) Business Structure of electronic markets. Hence, students will be taught the economic incentives that a market can impose on market participants, development models for implementing markets, and business models for the application of markets.

**Learning Content**

The ongoing advancements in information technology have revolutionized traditional business processes and given rise to electronic marketplaces. In contrast to physical marketplaces, electronic markets do not just evolve, but must be carefully designed, implemented and monitored and evaluated. Moreover electronic markets demand open and flexible platforms as well as adequate standards and information services. Future Market Engineers must therefore be able to consider the economic, legal and technological dimension of markets simultaneously. The lecture focuses on the discussion of (1) Microstructure, (2) IT Infrastructure, and (3) Business Structure of electronic markets. Hence, students will be taught the economic incentives that a market can impose on market participants, development models for implementing markets, and business models for the application of markets.

**Workload**

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

**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

**6.176 Course: Market Research [T-WIWI-107720]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - Sales Management](#)  
[M-WIWI-101490 - Marketing Management](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-101647 - Data Science: Evidence-based Marketing](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2019	2571150	<a href="#">Market Research</a>	2 SWS	Lecture (V)	Klarmann
SS 2019	2571151	<a href="#">Market Research Tutorial</a>	1 SWS	Practice (Ü)	Honold
Exams					
SS 2019	7900015	<a href="#">Market Research</a>		Prüfung (PR)	Klarmann
SS 2019	7900203	<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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Learning 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

**Annotation**

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Workload**

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

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6th. ed., Wiesbaden.

## T

**6.177 Course: Marketing Analytics [T-WIWI-103139]****Responsible:** Prof. Dr. Martin Klarmann**Organisation:** KIT Department of Economics and Management**Part of:** [M-INFO-102233 - Further Examinations](#)[M-WIWI-101647 - Data Science: Evidence-based Marketing](#)**Type**  
Written examination**Credits**  
4,5**Recurrence**  
Each winter term**Version**  
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

**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:*

## V

**Marketing Analytics**2572170, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Learning 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.

**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.

**Workload**

Total workload for 4.5 ECTS: ca. 135 hours



**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

**6.178 Course: Marketing Strategy Business Game [T-WIWI-102835]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101490 - Marketing Management](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)

Type	Credits	Recurrence	Version
Examination of another type	1,5	Each summer term	1

Events					
SS 2019	2571183	<a href="#">Marketing Strategy Business Game</a>	1 SWS	Block (B)	Klarmann, Assistenten
Exams					
SS 2019	7900022	<a href="#">Marketing Strategy Business Game</a>		Prüfung (PR)	Klarmann

**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 2019, 1 SWS, Language: German, [Open in study portal](#)

**Block (B)**

**Learning 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.

**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 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.

**Workload**

The total workload for this course is approximately 45.0 hours. For further information see German version.

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

## T

## 6.179 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

Exams				
SS 2019	8179-10001	My Thesis		Oberweis
SS 2019	8179-10002	My Thesis		Oberweis
SS 2019	8179-10003	Conceptual Design and Evaluation of Modular Handling and Assembly Systems for Stacking Fuel Cells for Use in Automotive Production		Fleischer
SS 2019	8179-10004	Analyzing Power Plant Behavior and Identifying Strategies with Generative Adversarial Neural Networks		Weinhardt
SS 2019	8179-10008	Development and Simulation of Business Models for the Circular Economy in a Global Context		Lanza
SS 2019	8179-10009	Analysis of Manufacturing Processes and Identification of Potential Issues in PEMFC Assembly for Automotive Mass Production with Focus on Technology Transfer from Other Industries		Fleischer
SS 2019	8179-10010	Trajektorienplanung in kooperativen Multi-Agent-Szenarien durch Deep Reinforcement Learning		Zöllner
SS 2019	8179-10011	Dynamic Pricing in Parahotellerie - an adaption using the example of CASAMUNDO		Heller, Schienle
SS 2019	8179-10012	Development and Implementation of Computer-Controlled Players for Use in Software-Based Wargaming Simulations		Lindstädt
SS 2019	8179-10013	a		
SS 2019	8179-10014	a		
SS 2019	8179-10015	Kopplung von Strom- und Gasinfrastruktur auf Verteilnetzebene zur Vermeidung von Einspeisemanagement		Weinhardt
SS 2019	8179-10016	Development of a Generic Process Model for the Integration of BPM and IoT		Oberweis
SS 2019	8179-10017	Reinforcement Learning in der Produktion - Eine Analyse der Entscheidungen, des Agentenverhaltens und des Einflusses von Demonstrationsdaten		Lanza
SS 2019	8179-10018	The Impact of Sustainability on Trading Behavior - A Retail Investor Perspective		Weinhardt
SS 2019	8179-10019	Development of a tool for linearizing economies-of-scale at the example of a techno-economic analysis of a lignocellulose biorefinery		
WS 19/20	8179-10020	Development of an instrument for the analysis, evaluation and avoidance of transport relevant CO2 emissions using the example of an automotive supplier		Schultmann

SS 2019	8179-10021	Measurement of Option Liquidity		Uhrig-Homburg
SS 2019	8179-10022	Business Models in Artificial Intelligence: Deduction of an Exemplary Business Model Based on an Analysis of Markets, Companies, and Experts		Lindstädt
SS 2019	8179-10025	Early Customer Integration in der Serviceentwicklung		Weinhardt
WS 19/20	8179-10027	A Techno-Economic Assessment of Compressed Biomethane Gas Production for Natural Gas Vehicles in Thailand		Schultmann
SS 2019	8179-10028	Investigation of the Deployment Potential of the Augmented Reality Solution MiRA on the NH90 Assembly Line and Development of an Implementation Roadmap		Fleischer
WS 19/20	8179-10029	Creation of a Model for Planning the Migration of Production Sites towards Autonomous Plants within a Global Production Network for a Middle-Class Automotive Supplier		Lanza
SS 2019	8179-10030	Development of a Simulation Model and Execution of a Simulation Study to Derive Recommendations for the Example of the Matrix Production of the Schaufensterfabrik II at SEW Eurodrive GmbH		Lanza
SS 2019	8179-10031	Fusion of mobility surveys supported by matching methods		Vortisch
SS 2019	8179-10032	Development of a Modular Planning Model for the Support of Production Ramp Ups in Global Value-Added Networks		Lanza
SS 2019	8179-10033	Development of a Generic Change Management Model to Guide and Accompany Industry 4.0-Initiatives within Companies		Lanza
SS 2019	8179-10034	Development of a Concept for Scalable Automation of Assembly Systems		Lanza
SS 2019	8179-10035	Conception and Implementation of an Integrative Graphical Process and Data-Modeling System for Production and Logistics Planning		Lanza
SS 2019	8179-10036	Development of a Method for Designing Business Performance Management within Global Production Networks Using the Example of a Medium-Sized Automotive Supplier		Lanza
SS 2019	8179-10037	Machine Learning-Driven Engineering: Application of AI in the Process and Product Development		Lanza
SS 2019	8179-10038	Semantic Segmentation of Worn Machine Inserts with Deep Learning		Satzger
SS 2019	8179-10039	Archetypes of Analytics-Based Services		Satzger
SS 2019	8179-10040	AI-based Recommendation of Design Steps Based on the CAD Model Tree		Lanza
SS 2019	8179-10041	Machine Learning in Production: Development of an Application for Human Activity Recognition on the Shop Floor		Lanza
SS 2019	8179-10042	Development of a Decentralized Technology Approach to Improve Order and Quality Management in Automotive Value Networks Using Distributed Ledger Technology		Lanza
SS 2019	8179-10043	Digitization in Industrial Assembly by Means of an Assistance System		Lanza

SS 2019	8179-10044	Development of a Planning Model for Assessing the Feasibility of the Integration of New Vehicle Models into Existing Product Lines		Lanza
SS 2019	8179-10045	Semi-Automated Selection of an Optimal Industry 4.0 Retrofit for Machine Tools		Fleischer
SS 2019	8179-10047	Predicting Taxi Trips with Deep Spatial-Temporal Neural Networks		Nickel
SS 2019	8179-10048	Impact of the Minimum Connection Time on the supply chain and connectivity: case study of Lufthansa Cargo AG		Nickel
SS 2019	8179-10049	Optimierungsprozess der Fabrikumstrukturierungsplanung des Groblayouts von KMU im Sondermaschinenbau		Lanza
SS 2019	8179-10050	: Procedural and methodical support of customer-oriented requirements management in the Early Phase of PGE – Product Generation Engineering		Albers
SS 2019	8179-10051	Product portfolio-spanning definition of functional product concepts in the Early Phase of the PGE – Product Generation Engineering by the example of the concept development at Dr. Ing. h.c. F. Porsche AG		Albers
SS 2019	8179-10052	Design and Evaluation of an ePrescription System Based on Distributed Ledger Technology		Sunyaev
SS 2019	8179-10053	Development of a cost model of a scalable modular supporting structure for bridge cranes		
SS 2019	8179-10054	Entwicklung einer Methode zur Erstellung eines Conversational Agents, der eine gesunde Ernährung unterstützt		Mädche
SS 2019	8179-10055	Conceptual design of a traceability model within a global production network of era-contact GmbH		Albers
SS 2019	8179-10056	Weighted Network analysis of the European airport network		Wigger
SS 2019	8179-10059	Job Shop Selection and Scheduling in Production Networks - An Optimization Approach		Furmans
SS 2019	8179-10060	Jobs-to-be-done method-based business opportunity design for an existing product program		Terzidis
SS 2019	8179-10061	166/5000 Cloud-based software functions to support the completion of jobs via a cloud manufacturing platform (using the example of Heidelberger Druckmaschinen AG)		Terzidis
WS 19/20	8179-10062	Probabilistic Forecasting and the Integration of Wind Power into the Swedish Electrical Grid		Mikut
SS 2019	8179-10063	Optimization and innovation of mobility systems using the example of Auckland's public transportation		Jochem
SS 2019	8179-10065	Information Sharing in Digital Ecosystems		Satzger
SS 2019	8179-10066	Optimization and Innovation of Mobility Systems using the Example of Aucklands's Public Transportation		Jochem
WS 19/20	8179-10067	folgt		Schmeck
SS 2019	8179-10068	Advanced Topics in Transfer Machine Learning: Transferability Analysis in Distributed and Automated Machine Learning Systems		Fromm

SS 2019	8179-10069	Bewertung haptischer Warnungen als Eskalationsstufe in der Übernahmeaufforderung des hochautomatisierten Fahrens bei der Daimler AG		Satzger
SS 2019	8179-10070	Laufzeitsicherheitsnachweise für Industrie 4.0 Materialflussanwendungen - Konzeptstudien mit System-Theoretischer Prozessanalyse		Furmans
SS 2019	8179-10071	Analysis of the Connectivity Structure in Knowledge Graphs		Sure-Vetter
WS 19/20	8179-10072	Improvement of Metaheuristik for logistics optimization		Mittwollen, Thomas
WS 19/20	8179-10073	Simulative investigation of different control strategies for shuttle systems		Furmans
SS 2019	8179-10074	Applying Nudges in Change Management – a Study about Choice Architectures as a Support for Organizational Change Processes		Weinhardt
SS 2019	8179-10075	Überwindung des Kaltstartproblems in der KI-Technologie - ein umfragebasierter Ansatz am Beispiel von tragbarem Schlaf-Tracker AURA		Klarmann
SS 2019	8600-10000	Usage profiles of free-floating carsharing in Karlsruhe		Vortisch
SS 2019	8600-10001	Agility scenarios of agile cooperation and derivation of an Agility Roadmap 2025 using Daimler AG as an example		Albers
SS 2019	8610-10003	Nachweis der DSGVO-Konformität: Entwurf einer automatisierten Lösung zur Erstellung des Verarbeitungsverzeichnisses		Sunyaev
SS 2019	8610-10004	Probabilistic Forecasting of Individual Electrical Load Using GRU Considering Weather Effects		Weinhardt
SS 2019	8610-10006	Evaluation and Implementation of Methods for Process Recognition With Artificial Neural Networks in Videos		Stork
SS 2019	8610-10007	Evaluation eines Konversationsagenten als instruktives Assistenzsystem für industrielle und häusliche Wartungsarbeit		Beigl
SS 2019	8610-10008	A Distributed Platform Approach to Cooperative Perception Based on Cellular-V2X Communication		Sax
SS 2019	8610-10009	Analyse von Bodenfeuchte-Zeitreihen mithilfe von neuronalen Netzen (Deep Learning)		Beigl
SS 2019	8610-10010	Value Propositions of Startups in the Context of Fundraising: Overstatements due to Vision Communications		Klarmann
SS 2019	8610-10011	Designing a Self-Learning Decision Support System for Viticulture Campaigns		Satzger
WS 19/20	8610-10012	Meta-Learning zur Erkennung von Anomalien in Energiezeitreihen		Hagenmeyer

**Competence Certificate**

see module description

**Prerequisites**

see module description

**Final Thesis**

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

**Submission deadline** 6 months**Maximum extension period** 3 months**Correction period** 8 weeks

## T

## 6.180 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500094	<a href="#">Mechanisms and Applications of Workflow Systems</a>		Prüfung (PR)	Mülle



## T

## 6.181 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](#)  
[M-INFO-101214 - Algorithms in Computer Graphics](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
3

**Recurrence**  
Each term

**Version**  
1

Events					
SS 2019	2400026	<a href="#">Praktikum</a> <a href="#">Unterteilungsalgorithmen</a>	2 SWS	Practical course (P)	Prautzsch, Xu

## T

**6.182 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 2019	2560240	<a href="#">Methods in Economic Dynamics</a>	SWS	Lecture (V)	Ott, Bälz
Exams					
SS 2019	7900108	<a href="#">Methods in Economic Dynamics</a>		Prüfung (PR)	Ott

**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:*

## V

**Methods in Economic Dynamics**

2560240, SS 2019, SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

The workshop offers the possibility to deepen the understanding about different aspects of theoretical modelling of innovation-based growth and induced economic effects. 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 discussed.

**Annotation**

The course has been added summer 2015.

**Workload**

The total workload for this course is approximately 45 hours.

Lecture: 15h

Preparation of lecture/exam: 30h

## T

**6.183 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

**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.

## T

**6.184 Course: Mixed Integer Programming I [T-WIWI-102719]****Responsible:** Prof. Dr. Oliver Stein**Organisation:** KIT Department of Economics and Management

**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)  
[M-WIWI-102832 - Operations Research in Supply Chain Management](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

**Type**  
Written examination

**Credits**  
4,5

**Recurrence**  
Irregular

**Version**  
1

Events					
WS 19/20	2550138	<a href="#">Mixed Integer Programming I</a>	SWS	Lecture (V)	Stein
WS 19/20	2550139	<a href="#">Exercises Mixed Integer Programming I</a>	SWS	Practice (Ü)	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.iior.kit.edu](http://kop.iior.kit.edu)).

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

## V

**Mixed Integer Programming I**

2550138, WS 19/20, SWS, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

Many optimization problems from economics, engineering and natural sciences are modeled with continuous as well as discrete variables. Examples are the energy minimal design of a chemical process in which several reactors may be switched on or off, or the time minimal covering of a distance with a vehicle equipped with a gear shift. While optimal points can be defined straightforwardly, for their numerical identification an interplay of ideas from discrete and continuous optimization is necessary.

The lecture treats methods for the numerical solution of linear optimization problems which depend on continuous as well as discrete variables. It is structured as follows:

- Existence results and concepts of linear as well as convex optimization
- LP relaxation and error bounds for rounding
- Gomory's cutting plane method
- Benders decomposition

Part II of the lecture treats nonlinear mixed integer programs.

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**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

**6.185 Course: Mixed Integer Programming II [T-WIWI-102720]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

## 6.186 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
4

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24643	<a href="#">Mobile Communications</a>	2 SWS	Lecture (V)	Jung, Waldhorst
Exams					
SS 2019	7500073	<a href="#">Mobile Communication</a>		Prüfung (PR)	Waldhorst, Zitterbart
WS 19/20	7500015	<a href="#">Mobile Communication</a>		Prüfung (PR)	Waldhorst, Zitterbart

## T

## 6.187 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500016	<a href="#">Model Driven Software Development</a>		Prüfung (PR)	Burger, Reussner
WS 19/20	7500086	<a href="#">Model Driven Software Development</a>		Prüfung (PR)	Reussner



## T

**6.188 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101448 - Service Management](#)  
[M-WIWI-101489 - Strategy, Communication, and Data Analysis](#)  
[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 2019	2540470	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>	2 SWS	Lecture (V)	Dorner, Knierim
SS 2019	2540471	<a href="#">Übung zu Modeling and Analyzing Consumer Behaviour with R</a>	1 SWS	Practice (Ü)	Knierim, Greif-Winzrieth
Exams					
SS 2019	7901391	<a href="#">Modeling and Analyzing Consumer Behavior with R</a>		Prüfung (PR)	Weinhardt
SS 2019	79791391	<a href="#">Modeling and Analyzing Consumer Behavior with R</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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

Students learn the fundamental methods, algorithms and concepts for analysing consumer data. The students deepen their knowledge in working on a case study and computer exercises, especially in the areas of e-commerce and behavioural economics. In addition, students learn to write applications in R and to organize and execute larger data mining and general data analytics projects. Furthermore, students learn methods for evaluating and visualizing data.

The event will focus on the following topics:

1. basic programming concepts in R
2. data mining with R using established process models such as CRISP-DM
3. text mining and analysis of online data with R
4. working on a case study from the area of Consumer and User Analytics
5. data visualization and evaluation with R

**Annotation**

The course has been added summer term 2015.

**Workload**

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

**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

**6.189 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-INFO-102233 - Further Examinations](#)  
[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

**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)**

**Learning 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.

**Annotation**

The lecture is for Master students who have already attended the introduction or have achieved comparable knowledge e.g. in a Bachelor thesis.

Interested students are requested to send an e-mail to Anika Pomes ([anika.pomes@kit.edu](mailto:anika.pomes@kit.edu)) from now until 29.09.2019, including the Bachelor's and the current Master's grade transcripts. If the introduction has not been checked, please let us know how the necessary knowledge has been obtained.

For further information see the webpage of the course.

The lecture is offered in every winter term. The planned lectures and courses for the next three years are announced online.

**Workload**

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



## 6.190 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 2019	24606	<a href="#">Modelle der Parallelverarbeitung</a>	3 SWS	Lecture (V)	Worsch, Vollmar
Exams					
SS 2019	75400003	<a href="#">Models of Parallel Processing</a>		Prüfung (PR)	Worsch

**T****6.191 Course: Multicore Computers and Computer Clusters [T-INFO-101325]**

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
 Oral examination

**Credits**  
 4

**Recurrence**  
 Each winter term

**Version**  
 1

Events					
WS 19/20	24112	<a href="#">Multikern-Rechner und Rechnerbündel</a>	2 SWS	Lecture (V)	Tichy

## T

**6.192 Course: Multivariate Statistical Methods [T-WIWI-103124]**

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**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.

**T****6.193 Course: Natural Language Processing and Software Engineering [T-INFO-101272]**

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	24187	<a href="#">Sprachverarbeitung in der Softwaretechnik</a>	2 SWS	Lecture (V)	Tichy, Weigelt
Exams					
SS 2019	7500185	<a href="#">Natural Language Processing and Software Engineering</a>		Prüfung (PR)	Tichy
WS 19/20	7543231	<a href="#">Natural Language Processing and Software Engineering</a>		Prüfung (PR)	Tichy

## T

## 6.194 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2019	24601	<a href="#">Netsicherheit: Architekturen und Protokolle</a>	2 SWS	Lecture (V)	Baumgart, Bless, Heseding, Zitterbart
Exams					
SS 2019	7500072	<a href="#">Network Security: Architectures and Protocols</a>	Prüfung (PR)		Zitterbart
WS 19/20	7500014	<a href="#">Network Security: Architectures and Protocols</a>	Prüfung (PR)		Zitterbart



## T

## 6.195 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2019	24674	<a href="#">Next Generation Internet</a>	2 SWS	Lecture (V)	Bless
Exams					
SS 2019	7500074	<a href="#">Next Generation Internet</a>		Prüfung (PR)	Bless, Zitterbart
WS 19/20	7500016	<a href="#">Next Generation Internet</a>		Prüfung (PR)	Bless, Zitterbart

## T

## 6.196 Course: Non- and Semiparametrics [T-WIWI-103126]

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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		2 SWS	Lecture (V)	Schienle
WS 19/20	2521301		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 "*Applied Econometrics*" [2520020]

**Annotation**

The course takes place every second winter semester: 2018/19 then 2020/21



## 6.197 Course: Nonlinear Optimization I [T-WIWI-102724]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900064_SS2019_NK	<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 and possibly of a compulsory prerequisite.

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:*



## Nonlinear Optimization I

2550111, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

### Learning 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, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

### Annotation

Part I and II of the lecture are held consecutively in the *same* semester.

**Literature**

**Elective literature:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

## T

**6.198 Course: Nonlinear Optimization I and II [T-WIWI-103637]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900066_SS2019_NK	<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:*

## V

**Nonlinear Optimization I**

2550111, WS 19/20, 2 SWS, [Open in study portal](#)

**Lecture (V)**

**Learning 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, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**Annotation**

Part I and II of the lecture are held consecutively in the **same** semester.

**Literature****Elective literature:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**Nonlinear Optimization II**2550113, WS 19/20, 2 SWS, [Open in study portal](#)**Lecture (V)****Learning 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, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of 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 for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**Annotation**

Part I and II of the lecture are held consecutively in *thesamesemester*.

**Literature****Elective literature:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

## T

**6.199 Course: Nonlinear Optimization II [T-WIWI-102725]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900065_SS2019_NK	<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:*

## V

**Nonlinear Optimization II**

2550113, WS 19/20, 2 SWS, [Open in study portal](#)

**Lecture (V)**

**Learning 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, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of 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 for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

**Annotation**

Part I and II of the lecture are held consecutively in the same semester.

**Literature****Elective literature:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000



## T

**6.200 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-102805 - Service Operations](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

**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

**6.201 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-INFO-102233 - Further Examinations](#)  
[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**  
Written examination

**Credits**  
4,5

**Recurrence**  
Irregular

**Version**  
2

Events					
SS 2019	2550480	<a href="#">Operations Research in Supply Chain Management</a>	2 SWS	Lecture (V)	Nickel
SS 2019	2550481	<a href="#">Übungen zu OR in Supply Chain Management</a>	1 SWS	Practice (Ü)	Dunke
Exams					
SS 2019	7900128	<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.iior.kit.edu/english/Courses.php>.

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

## V

**Operations Research in Supply Chain Management**

2550480, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

Supply Chain Management constitutes a general tool for logistics process planning in supply networks. To an increasing degree quantitative decision support is provided by methods and models from Operations Research. The lecture "OR in Supply Chain Management" conveys concepts and approaches for solving practical problems and presents an insight to current research topics. The lecture's focus is set on modeling and solution methods for applications originating in different domains of a supply chain. The emphasis is put on mathematical methods like mixed integer programming, valid inequalities or column generation, and the derivation of optimal solution strategies.

In form and content, the lecture addresses all levels of Supply Chain Management: After a short introduction, the tactical and operational level will be discussed with regard to inventory models, scheduling as well as cutting and packing. The strategic level will be discussed in terms of layout planning. Another main focus of the lecture is the application of methods from online optimization. This optimization discipline has gained more and more importance in the optimization of supply chains over the several past years due to an increasing amount of dynamic data flows.

**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>.

**Workload**

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

**Literature**

- Simchi-Levi, D.; Chen, X.; Bramel, J.: The Logic of Logistics: Theory, Algorithms, and Applications for Logistics and Supply Chain Management, 2nd edition, Springer, 2005
- Simchi-Levi, D.; Kaminsky, P.; Simchi-Levi, E.: Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, McGraw-Hill, 2000
- Silver, E. A.; Pyke, D. F.; Peterson, R.: Inventory Management and Production Planning and Scheduling, 3rd edition, Wiley, 1998
- Blazewicz, J.: Handbook on Scheduling - From Theory to Applications, Springer, 2007
- Pinedo, M. L.: Scheduling - Theory, Algorithms, and Systems (3rd edition), Springer, 2008
- Dyckhoff, H.; Finke, U.: Cutting and Packing in Production and Distribution - A Typology and Bibliography, Physica-Verlag, 1992
- Borodin, A.; El-Yaniv, R.: Online Computation and Competitive Analysis, Cambridge University Press, 2005
- Francis, R. L.; McGinnis, L. F.; White, A.: Facility Layout and Location: An Analytical Approach, 2nd edition, Prentice-Hall, 1992

## T

## 6.202 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)	Sudermann-Merx

**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

## 6.203 Course: Optimization under Uncertainty [T-WIWI-106545]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900202	<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

## 6.204 Course: Panel Data [T-WIWI-103127]

**Responsible:** apl. Prof. Dr. Wolf-Dieter Heller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2520320	<a href="#">Paneldaten</a>	2 SWS	Lecture (V)	Heller
SS 2019	2520321	<a href="#">Übungen zu Paneldaten</a>	2 SWS	Practice (Ü)	Heller
Exams					
SS 2019	7900115	<a href="#">Panel Data</a>		Prüfung (PR)	Heller

**Prerequisites**

None

## T

## 6.205 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	75489	<a href="#">Parallel Algorithms</a>		Prüfung (PR)	Sanders

## T

## 6.206 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2019	24617	<a href="#">Parallel computer systems and parallel programming</a>	2 SWS	Lecture (V)	Streit, Häfner
Exams					
SS 2019	7500141	<a href="#">Parallel computer systems and parallel programming</a>		Prüfung (PR)	Streit



## T

## 6.207 Course: Parametric Optimization [T-WIWI-102855]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101473 - Mathematical Programming](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Exams				
SS 2019	7900068_SS2019_NK	<a href="#">Parametric Optimization</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

## 6.208 Course: Patent Law [T-INFO-101310]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
3

**Recurrence**  
Each summer term

**Version**  
2

Events					
SS 2019	24656	<a href="#">Patent Law</a>	2 SWS	Lecture (V)	Koch
Exams					
SS 2019	7500062	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500001	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz

## T

**6.209 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-101238 - Automated visual inspection](#)  
[M-INFO-101239 - Machine Vision](#)  
[M-INFO-101241 - Image-based detection and classification](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	24675	<a href="#">Pattern Recognition</a>	2 SWS	Lecture (V)	Beyerer
Exams					
SS 2019	7500032	<a href="#">Pattern Recognition</a>		Prüfung (PR)	Beyerer
WS 19/20	7500111	<a href="#">Pattern Recognition</a>		Prüfung (PR)	Beyerer

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

## V

**Pattern Recognition**

24675, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Description****Features:**

- types of features
- exploration of the feature space
- transformation of the features
- distance measures within the feature space
- normalization of features
- selection and construction of features
- reduction of the dimension of the feature space

**Classifiers:**

- Bayesian decision theory
- parameter estimation
- parameter free methods
- linear classifiers
- support vector machine
- template matching, matched filter
- classification with rejection
- classification with regard to nominal features

**General principles:**

- Vapnik-Chervonenkis theory
- evaluation of classifiers
- boosting

**Learning Content**

## Features:

- types of features
- exploration of the feature space
- transformation of the features
- distance measures within the feature space
- normalization of features
- selection and construction of features
- reduction of the dimension of the feature space

## Classifiers:

- Bayesian decision theory
- parameter estimation
- parameter free methods
- linear classifiers
- support vector machine
- template matching, matched filter
- classification with rejection
- classification with regard to nominal features

## General principles:

- Vapnik-Chervonenkis theory
- evaluation of classifiers
- boosting

## T

**6.210 Course: Personalization and Services [T-WIWI-102848]**

**Responsible:** Dr.-Ing. Andreas Sonnenbichler  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900283	<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)**

**Learning Content**

- Personalization of Services and Applications
- User Modeling
- User Profiles
- Authentication
- Authorization
- Applications in e-Commerce and for internet-based Services
- Personalized Web Search
- Privacy

**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**

**Literature**

The course follows latest scientific papers. References to these papers are listed at the end of each course unit.

## T

**6.211 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)

**Learning 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.

**Workload**

Total effort required will account for approximately 165h (5.5 credits).

**Literature**

will be announced in the course

## T

**6.212 Course: Portfolio and Asset Liability Management [T-WIWI-103128]**

**Responsible:** Dr. Mher Safarian  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101639 - Econometrics and Statistics II](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2019	2520357	<a href="#">Portfolio and Asset Liability Management</a>	2 SWS	Lecture (V)	Safarian
SS 2019	2520358	<a href="#">Übungen zu Portfolio and Asset Liability Management</a>	2 SWS	Practice (Ü)	Safarian
Exams					
SS 2019	7900116	<a href="#">Portfolio and Asset Liability Management</a>		Prüfung (PR)	Safarian

**Competence Certificate**

The assessment of this course consists of a written examination (following §4(2), 1 SPOs, 180 min.) and of possible additional assignments during the course (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

**Prerequisites**

None

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

## V

**Portfolio and Asset Liability Management**

2520357, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

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

**Learning 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**

The total workload for this course is approximately 150 hours. For further information see German version.

**Literature**

To be announced in lecture.

**Elective literature:**

To be announced in lecture.



**T****6.213 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	2

Events					
SS 2019	24893	<a href="#">Practical Course Computer Vision for Human-Computer Interaction</a>	2 SWS	Practical course (P)	Stiefelhagen, Zündorf, Roitberg
Exams					
SS 2019	7500080	<a href="#">Practical Course Computer Vision for Human-Computer Interaction</a>		Prüfung (PR)	Stiefelhagen
WS 19/20	7500136	<a href="#">Practical Course Computer Vision for Human-Computer Interaction</a>		Prüfung (PR)	Stiefelhagen

## T

## 6.214 Course: Practical Course Protocol Engineering [T-INFO-104386]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101206 - Networking](#)  
[M-INFO-102233 - Further Examinations](#)

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

## 6.215 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-102233 - Further Examinations](#)  
[M-INFO-102807 - Practical Course: Analysis of Complex Data Sets](#)

**Type**  
Completed coursework

**Credits**  
4

**Recurrence**  
Irregular

**Version**  
1

Exams				
SS 2019	7500096	<a href="#">Practical Course Analysis of Complex Data Sets</a>	Prüfung (PR)	Böhm

## T

## 6.216 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](#)  
[M-INFO-102233 - Further Examinations](#)

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

## 6.217 Course: Practical Course: Geometric Modeling [T-INFO-103207]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101214 - Algorithms in Computer Graphics](#)  
[M-INFO-101666 - Practical Course: Geometric Modeling](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each winter term	1

Events					
SS 2019	2400107	<a href="#">Praktikum Geometrisches Modellieren</a>	2 SWS	Practical course (P)	Prautzsch, Xu
WS 19/20	2400024	<a href="#">Praktikum</a>	SWS	Practical course (P)	Xu, Prautzsch
Exams					
SS 2019	7500212	<a href="#">Practical course: Geometric Modeling</a>		Prüfung (PR)	Prautzsch

**T****6.218 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-102233 - Further Examinations](#)  
[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

## 6.219 Course: Practical Course: Smart Data Analytics [T-INFO-106426]

**Responsible:** Prof. Dr.-Ing. Michael Beigl  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-INFO-103235 - Practical Course: Smart Data Analytics](#)

Type	Credits	Recurrence	Version
Examination of another type	6	Each summer term	1

Events					
SS 2019	24895	<a href="#">Practical Course: Smart Data Analytics</a>	4 SWS	Practical course (P)	Beigl, Riedel, Ravivanpong, Pescara
Exams					
SS 2019	7500088	<a href="#">Practical Course: Smart Data Analytics</a>		Prüfung (PR)	Beigl, Riedel

**T****6.220 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**  
Examination of another type

**Credits**  
5

**Recurrence**  
Each summer term

**Version**  
2

Events					
SS 2019	24873	<a href="#">Practical Course: Web Applications and Service-Oriented Architectures (II)</a>	2 SWS	Practical course (P)	Abeck, Schneider
Exams					
SS 2019	7500139	<a href="#">Practical Course: Web Applications and Service-Oriented Architectures (II)</a>		Prüfung (PR)	Abeck



## T

**6.221 Course: Practical Seminar Digital Service Systems [T-WIWI-106563]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-102808 - Digital Service Systems in Industry](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Irregular	1

Events					
SS 2019	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design</a>	3 SWS	Lecture (V)	Mädche
WS 19/20	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design</a>	3 SWS	Seminar (S)	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**

Lecture (V)

2540554, SS 2019, 3 SWS, [Open in study portal](#)

**Description**

Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: "The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes." Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management**. The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

**Learning Content**

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

**Practical Seminar: Information Systems & Service Design**2540554, WS 19/20, 3 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Description**

Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: "The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes." Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management**. The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

**Learning Content**

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

T

**6.222 Course: Practical Seminar Knowledge Discovery [T-WIWI-102670]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-102827 - Service Computing](#)

Type	Credits	Recurrence	Version
Examination of another type	4	Each term	1

**Competence Certificate**

The assessment of this course is according to §4(2), 3 SPO in form of an examination of the written seminar thesis, a presentation and a project. The final mark is based on the examination of the written seminar thesis and the project but can be upgraded or downgraded according to the quality of the presentation.

**Prerequisites**

None

**Recommendation**

Knowledge of algorithms in the area of knowledge discovery is assumed. Therefore it is recommended to attend the course [2511302] Knowledge Discovery beforehand.

## T

**6.223 Course: Practical Seminar Service Innovation [T-WIWI-102799]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**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: Practical Seminar: Advanced Analytics [T-WIWI-108765]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103118 - Data Science: Data-Driven User Modeling](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	1

Exams				
SS 2019	7900211	<a href="#">Practical Seminar: Advanced Analytics</a>	Prüfung (PR)	Weinhardt

**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

**6.225 Course: Practical Seminar: Data-Driven Information Systems [T-WIWI-106207]**

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

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

**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	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

**6.226 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-102805 - Service Operations](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each term	2

Events					
SS 2019	2550498	<a href="#">Practical seminar: Health Care Management</a>	5 SWS		Nickel, Reuter-Oppermann
Exams					
SS 2019	7900014	<a href="#">Practical Seminar: Health Care Management (with Case Studies)</a>	Prüfung (PR)		Nickel

**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.iwr.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.

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

V

**Practical seminar: Health Care Management**

2550498, SS 2019, 5 SWS, Language: German, [Open in study portal](#)

**Learning Content**

Processes in a hospital are often grown historically ("We have always done it this way"), so that there has not been the need to analyze processes until reforms of the health system have put increasing pressure on hospitals. Consequently, nowadays hospitals look for possibilities to improve their processes. The students are confronted with case studies and are asked to develop a solution. Therefore they have to collect and analyze relevant data, processes and structures. When developing the solution the students have to bear in mind that besides the economic efficiency also the quality of care and patient satisfaction (e.g. measured in waiting time) may not be neglected in the health care sector.

**Annotation**

The lecture is offered every term.

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

**Workload**

The total workload for this course is approximately 135 hours. For further information see German version.

**Literature**

**Elective literature:**

- Fleßa: Grundzüge der Krankenhausbetriebslehre, Oldenbourg, 2007
- Fleßa: Grundzüge der Krankenhaussteuerung, Oldenbourg, 2008
- Hall: Patient flow: reducing delay in healthcare delivery, Springer, 2006



**T****6.227 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-INFO-102233 - Further Examinations](#)  
[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 2019	2540554	<a href="#">Practical Seminar: Information Systems &amp; Service Design</a>	3 SWS	Lecture (V)	Mädche
Exams					
SS 2019	7900261	<a href="#">Information Systems and Design (ISSD) Seminar</a>		Prüfung (PR)	Mädche
SS 2019	7900262	<a href="#">Practical Seminar: Information Systems and Service Design / Seminarpraktikum: Information Systems und Service Design</a>		Prüfung (PR)	Mädche
SS 2019	7900265	<a href="#">Interactive Analytics Seminar</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**

2540554, SS 2019, 3 SWS, [Open in study portal](#)

**Lecture (V)****Description**

Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: "The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes." Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management**. The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

### Learning Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

## T

## 6.228 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-INFO-102233 - Further Examinations](#)  
[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

**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

**6.229 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101409 - Electronic Markets](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

**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.

## T

**6.230 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - 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

**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)**

**Learning 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.

**Annotation**

- 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 following courses can be chosen in the Sales Management Module: Country Manager Simulation, Case Studies in Sales and Pricing or Preisverhandlungen und Verkaufspräsentationen.
- 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.

**Workload**

The total workload for this course is approximately 45.0 hours. For further information see German version.

**Literature**

None

## T

**6.231 Course: Pricing [T-WIWI-102883]**

**Responsible:** Dr. Sven Feurer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - Sales Management](#)  
[M-WIWI-101489 - Strategy, Communication, and Data Analysis](#)  
[M-WIWI-101490 - Marketing Management](#)  
[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					
SS 2019	7900081	<a href="#">Pricing</a>		Prüfung (PR)	Feurer
WS 19/20	7900138	<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)

**Learning 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

**Annotation**

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Workload**

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

## T

**6.232 Course: Product and Innovation Management [T-WIWI-109864]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101490 - Marketing Management](#)  
[M-WIWI-101510 - Cross-Functional Management Accounting](#)  
[M-WIWI-101514 - Innovation Economics](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	2571154	<a href="#">Product and Innovation Management</a>	2 SWS	Lecture (V)	Klarmann
Exams					
SS 2019	7900024	<a href="#">Product- and Innovation Management</a>		Prüfung (PR)	Klarmann
SS 2019	7900204	<a href="#">Product and Innovation Management</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

**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 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning 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.

**Annotation**

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

**Workload**

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

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

## T

**6.233 Course: Production and Logistics Management [T-WIWI-102632]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101412 - Industrial Production III](#)

Type	Credits	Recurrence	Version
Written examination	5,5	Each summer term	1

Events					
SS 2019	2581954	<a href="#">Production and Logistics Management</a>	2 SWS	Lecture (V)	Schultmann
SS 2019	2581955	<a href="#">Übung zu Produktions- und Logistikmanagement</a>	2 SWS	Practice (Ü)	Rudi, Zimmer
Exams					
SS 2019	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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Description**

This course covers central tasks and challenges of an operative production and logistics management. Students get to know the set-up and mode of operation of planning systems such as PPS-, ERP- and Advanced Planning Systems to cope with the accompanying planning tasks. Methods to solve these tasks will be explored with respect to manufacturing program planning, material and time. Alongside to MRP II, students will be introduced to integrated supply chain management approaches in PPS. Finally, commercially available PPS-, ERP- and Advanced Planning Systems will be presented and discussed.

**Learning Content**

This course covers central tasks and challenges of operational production and logistics management. Systems analytically, central planning tasks are discussed. Exemplary solution approaches for these tasks are presented. Further practical approaches are explained. Students get to know the set-up and mode of operation of planning systems such as PPS-, ERP- and Advanced Planning Systems to cope with the accompanying planning tasks. Alongside to MRP II, students will be introduced to integrated supply chain management approaches in Supply Chain Management.

**Workload**

Total effort required will account for approximately 165h (5.5 credits).

**Literature**

will be announced in the course



## T

**6.234 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
Exams					
WS 19/20	7900107	<a href="#">Advanced Lab Cognitive Automobile 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)**

**Notes****Learning objectives:**

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

**Workload:**

The workload of 4.5 credits consists of time of attendance at the test site for the practical implementation of the chosen solution, as well as the time for literature research and planning / specification of the planned solution. In addition, a short report and a presentation of the work carried out will be prepared.

**T****6.235 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 2019	2512500	<a href="#">Projektpraktikum Maschinelles Lernen</a>	3 SWS	Practical course (P)	Zöllner
Exams					
SS 2019	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

## T

**6.236 Course: Project Management [T-WIWI-103134]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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:*

## V

**Project Management**

2581963, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Learning 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

**Workload**

The total workload for this course is approximately 105 hours. For further information see German version.

**Literature**

will be announced in the course

## T

**6.237 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Completed coursework	1,5	Irregular	1

Events					
SS 2019	2400019	<a href="#">Project Management in Practice</a>	2 SWS	Lecture (V)	Böhm, Schnober
Exams					
SS 2019	7500291	<a href="#">Project Management in Practice</a>		Prüfung (PR)	Böhm

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

## V

**Project Management in Practice**

2400019, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

- General project conditions
- Project goals / creative methods for identifying project goals and priorities
- Project planning
- Activity planning
- Cost/time/resource planning
- Phase models
- Risk management
- Project control / success control / monitoring
- Crisis management
- Project termination / lessons learned

## T

**6.238 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
SS 2019	24166	<a href="#">Provable Security in Cryptography</a>	2 SWS	Lecture (V)	Hofheinz
Exams					
SS 2019	7500109	<a href="#">Provable Security in Cryptography</a>		Prüfung (PR)	Geiselmann, Hofheinz, Müller-Quade

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

## V

**Provable Security in Cryptography**

24166, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

When is an encryption scheme secure? What type of security is guaranteed by a digital signature scheme? How can secure cryptographic systems be constructed? These and more questions are the topic of this lecture. We put particular emphasis on concrete examples: we will present several cryptographic schemes (such as encryption schemes) and analyze their security properties. In this, the notion of a security proof will play a central role. We endeavour to find mathematical proofs that a given system achieves certain desirable properties under well-defined complexity-theoretic assumptions.

## T

**6.239 Course: Public Management [T-WIWI-102740]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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
Exams					
SS 2019	790puma	<a href="#">Public Management</a>		Prüfung (PR)	Wigger
WS 19/20	790puma	<a href="#">Public Management</a>		Prüfung (PR)	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)

**Learning Content**

The lecture "Public Management" deals with the economic theory of public sector administration. It is divided into four parts. The first section gives an overview of the legal framework of governmental administration in the Federal Republic of Germany and introduces the classical theory of administration as developed by Weber. Part two studies concepts of public decision-making, which have a significant impact on the operation of public sector administrations and where one focus is on consistency problems of collective decision-making. The third chapter deals with efficiency problems arising in conventionally organized public administrations and companies. X-inefficiency, information and control problems, the isolated consideration of income-spending-relations as well as rent-seeking problems will be considered. In section four the concept of New Public Management, which is a new approach to public sector administration that is mainly based in contract theory, is introduced. Its foundations in institutional economics are developed, with a focus on the specific incentive structures in self-administered administrations. Finally, the achievements of New Public Management approaches are discussed.

**Workload**

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

**Literature****Elective literature:**

- Damkowski, W. and C. Precht (1995): Public Management; Kohlhammer
- Richter, R. and E.G. Furubotn (2003): Neue Institutionenökonomik; 3rd edition; Mohr
- Schedler, K. and I. Proeller (2003): New Public Management; 2nd edition; UTB
- Mueller, D.C. (2009): Public Choice III; Cambridge University Press
- Wigger, B.U. (2006): Grundzüge der Finanzwissenschaft; 2nd edition; Springer

## T

## 6.240 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500058	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500062	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz

## T

**6.241 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 2019	2560120	<a href="#">Public Revenues</a>	2 SWS	Lecture (V)	Wigger
SS 2019	2560121	<a href="#">Übung zu Öffentliche Einnahmen</a>	1 SWS	Practice (Ü)	Wigger
Exams					
SS 2019	790oeff	<a href="#">Public Revenues</a>		Prüfung (PR)	Wigger
WS 19/20	790oeff	<a href="#">Public Revenues</a>		Prüfung (PR)	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 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Description**

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 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.

**Workload**

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



**Literature**

**Elective literature:**

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4th ed., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I* and *Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2nd ed., Springer

**T****6.242 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**  
Examination of another type

**Credits**  
3

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	2500016	<a href="#">Python for Computational Risk and Asset Management</a>	2 SWS	Practical course (P)	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)****Description**

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.

**Learning Content**

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

**Workload**

The total workload for this course is approximately 90 hours.

## T

**6.243 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)

**Learning 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.

**Workload**

The total workload for this course is approximately 120 hours. For further information see German version.

## T

## 6.244 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
5

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24171	<a href="#">Randomized Algorithms</a>	3 SWS	Lecture / Practice (VÜ)	Worsch
Exams					
SS 2019	75400002	<a href="#">Randomized Algorithms</a>		Prüfung (PR)	Worsch

## T

**6.245 Course: Recommender Systems [T-WIWI-102847]**

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2540506	<a href="#">Recommender Systems</a>	2 SWS	Lecture (V)	Geyer-Schulz
SS 2019	2540507	<a href="#">Exercise Recommender Systems</a>	1 SWS	Practice (Ü)	Schweizer
Exams					
SS 2019	7900138	<a href="#">Recommender Systems</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

**Recommender Systems**

2540506, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning 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.

**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**

**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.

**Elective literature:**

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

## 6.246 Course: Regulation Theory and Practice [T-WIWI-102712]

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**6.247 Course: Requirements Engineering [T-INFO-101300]**

**Responsible:** Prof. Dr.-Ing. Anne Koziolk  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-101202 - Software Methods](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2019	2400050	<a href="#">Requirements Engineering</a>	2 SWS	Lecture (V)	Koziolk
Exams					
SS 2019	7500059	<a href="#">Requirements Engineering</a>		Prüfung (PR)	Koziolk
SS 2019	7500295	<a href="#">Requirements Engineering Second Exam VL 2400050</a>		Prüfung (PR)	Koziolk

**Recommendation**

Das Modul Softwaretechnik II wird empfohlen.

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

## V

**Requirements Engineering**

2400050, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

Having a good requirements specification is a critical prerequisite for any successful software project. This lecture gives an introduction to processes, methods and representation forms for specifying and managing requirements.

The topics include background and general overview, processes and methods for requirements elicitation, specification with natural language, object-oriented specification, use cases, UML, specification of quality requirements and constraints, as well as requirements validation and management.

**Notes**

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.

**Workload**

Two SWS (1.5 hours) of lecture per week in 15 weeks plus ca. 15 hours preparation for the exam = 90h

**Literature**

The lecture is based on slides and works by Martin Glinz, which is why there is no book that accompanies the lecture. Students are welcome to discuss differences between the lecture and the content of the course in class.

Main suggestion: Pohl, K. (2010). Requirements Engineering: Fundamentals, Principles, and Techniques. Springer Verlag. (will be available in library)

Further reading:

- 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

**6.248 Course: Risk Management in Industrial Supply Networks [T-WIWI-102826]**

**Responsible:** Dr. Marcus Wiens  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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	<a href="#">Risk Management in Industrial Supply Networks</a>	2 SWS	Lecture (V)	Wiens
WS 19/20	2581993	<a href="#">Übung zu Risk Management in Industrial Supply Networks</a>	1 SWS	Practice (Ü)	Klein, Wiens
Exams					
SS 2019	7981992	<a href="#">Risk Management in Industrial Supply Networks</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. 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)

**Learning Content**

- supply chain management: introduction, aims and trends
- industrial risk management
- definition und characterization of risks: sourcing and procurement, demand, production and infrastructure
- identification of risks
- risk controlling
- risk assessment and decision support tools
- risk prevention and mitigation strategies
- robust design of supply chain networks
- supplier selection
- capacity management
- business continuity management

**Workload**

The total workload for this course is approximately 105 hours. For further information see German version.

**Literature**

will be announced in the course

## T

**6.249 Course: Roadmapping [T-WIWI-102853]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2545102	<a href="#">Roadmapping</a>	2 SWS	Seminar (S)	Koch
Exams					
SS 2019	7900055	<a href="#">Roadmapping</a>		Prüfung (PR)	Weissenberger-Eibl

**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

**Roadmapping**

2545102, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Learning Content**

Roadmapping is a method used to support innovation decisions in the early phase of innovation management. The roadmapping process addresses the procedure of constructing roadmaps which can then be assessed. Roadmapping provides structured and graphical visualizations of preferably future-oriented topics which have innovation potentials. The benefits of the roadmapping method lie in the structured bundling of both technology- and market-driven individual topics and the joint setting of priorities and processes to achieve predetermined corporate targets. As a rule, roadmaps represent a consensus reached by the people involved in their compilation. For this reason, roadmaps are suited to the designation and initial prioritization of emerging technologies and corresponding development projects.

**Workload**

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

**T****6.250 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					
SS 2019	7500218	<a href="#">Robotik I - Einführung in die Robotik</a>		Prüfung (PR)	Asfour
WS 19/20	7500106	<a href="#">Robotics I - Introduction to Robotics</a>		Prüfung (PR)	Asfour

## T

**6.251 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	3

Events					
SS 2019	2400074	<a href="#">Robotics II: Humanoid Robotics</a>	2 SWS	Lecture (V)	Asfour, Wächter
Exams					
SS 2019	7500086	<a href="#">Robotics II: Humanoid Robotics</a>		Prüfung (PR)	Asfour
WS 19/20	7500211	<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 2019, 2 SWS, Language: German/English, [Open in study portal](#)

**Lecture (V)**

**Learning 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

**Workload**

90 h

## T

**6.252 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 2019	2400067	<a href="#">Robotics III - Sensors and Perception in Robotics</a>	2 SWS	Lecture (V)	Asfour, Grotz
Exams					
SS 2019	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 2019, 2 SWS, Language: German/English, [Open in study portal](#)

**Lecture (V)**

**Learning 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.

**Workload**

90h

## T

**6.253 Course: Sales Management and Retailing [T-WIWI-102890]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101487 - Sales Management](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2572156	<a href="#">Sales Management and Retailing</a>	2 SWS	Lecture (V)	Klarmann
Exams					
SS 2019	7900196	<a href="#">Sales Management and Retailing</a>		Prüfung (PR)	Klarmann
WS 19/20	7900080	<a href="#">Sales Management and Retailing</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**

The lecture is compulsory for the module Sales Management. It is taught in English.  
 For further information please contact Marketing and Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

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

## V

**Sales Management and Retailing**

2572156, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

The aim of the course "Sales Management and Retailing" is on the one hand to give insights into the challenging realization of a successful sales management and on the other hand to discuss peculiarities of retailing contexts. The contents are below others:

- Customer relationship management (word-of-mouth-analysis, key account management, loyalty programs, complain management etc.)
- Retail marketing (trends, point of sale design etc.)
- Retailer-producer relationships

**Annotation**

For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

This course is held in English.

**Workload**

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

**Literature**

Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.



**T****6.254 Course: Secure Multiparty Computation [T-INFO-108540]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-104119 - Secure Multiparty Computation](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each term	1

## T

## 6.255 Course: Security [T-INFO-101371]

**Responsible:** Prof. Dr. Dennis Hofheinz  
Prof. Dr. Jörn Müller-Quade

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101197 - Computer Security](#)  
[M-INFO-101207 - Networking Security - Theory and Praxis](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2019	24941	<a href="#">Security</a>	3 SWS	Lecture (V)	Müller-Quade
Exams					
SS 2019	7500263	<a href="#">Security</a>		Prüfung (PR)	Müller-Quade
SS 2019	7500292	<a href="#">Security</a>		Prüfung (PR)	Müller-Quade

## T

**6.256 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-104403 - Critical Digital Infrastructures](#)

Type	Credits	Recurrence	Version
Examination of another type	4,5	Each summer term	2

Events					
SS 2019	2513401	<a href="#">Selected Issues in Critical Information Infrastructures</a>	SWS	Seminar (S)	Sunyaev, Lins
Exams					
SS 2019	7900114	<a href="#">Selected Issues in Critical Information Infrastructures</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****6.257 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 2019	24821	<a href="#">Selected legal issues of Internet law</a>	2 SWS	Colloquium (KOL)	Dreier
Exams					
SS 2019	7500226	<a href="#">Selected legal issues of Internet law</a>		Prüfung (PR)	Dreier

## T

**6.258 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2019	24623	<a href="#">Selected topics in Cryptography</a>	2 SWS	Lecture (V)	Müller-Quade, Klooß, Mechler
Exams					
SS 2019	7500222	<a href="#">Selected Topics in Cryptography</a>		Prüfung (PR)	Geiselman, Müller-Quade, Hofheinz

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

## V

**Selected topics in Cryptography**

24623, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Learning Content**

- 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

**T****6.259 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Completed coursework	1,5	Irregular	1

## T

**6.260 Course: Semantic Web Technologies [T-WIWI-102874]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101455 - Web Data Management](#)  
[M-WIWI-101457 - Semantic Technologies](#)  
[M-WIWI-102827 - Service Computing](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2511310	<a href="#">Semantic Web Technologies</a>	2 SWS	Lecture (V)	Sure-Vetter, Acosta Deibe, Käfer
SS 2019	2511311	<a href="#">Exercises to Semantic Web Technologies</a>	1 SWS	Practice (Ü)	Sure-Vetter, Acosta Deibe, Käfer
Exams					
SS 2019	7900028	<a href="#">Semantic Web Technologies</a>		Prüfung (PR)	Sure-Vetter
WS 19/20	7900022	<a href="#">Semantic Web Technologies</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 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

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.

**Learning Content**

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

**Workload**

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preparation and postprocessing: 67.5 hours
- Exam and exam preparation: 37.5 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.

**Additional Literature**

- 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 2019, 1 SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Description**

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.

**Learning Content**

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

**Workload**

The total workload for the lecture Semantic Web Technologies is given out on the description of the lecture.

**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.

**Additional Literature**

- 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

**6.261 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-102736 - Seminar Module Economic Sciences](#)**Type**  
Examination of another type**Credits**  
3**Recurrence**  
Each term**Version**  
1

Events					
SS 2019	2400121	<a href="#">Interactive Analytics Seminar</a>	2 SWS		Beigl, Mädche, Pescara, Toreini
SS 2019	2500006	<a href="#">Seminar Human Resource Management (Master)</a>	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2500007	<a href="#">Seminar Human Resources and Organizations (Master)</a>	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2530372	<a href="#">Automated Financial Advisory</a>	2 SWS	Seminar (S)	Ulrich
SS 2019	2530374	<a href="#">Applied Risk and Asset Management</a>	2 SWS	Seminar (S)	Ulrich
SS 2019	2530580	<a href="#">Seminar in Finance (Master, Prof. Uhrig-Homburg)</a>	2 SWS	Seminar (S)	Uhrig-Homburg, Hofmann, Reichenbacher, Eska
SS 2019	2540510	<a href="#">Masterseminar Big Data Mining in Finance</a>	2 SWS	Seminar (S)	Geyer-Schulz
SS 2019	2540559	<a href="#">Digital Service Design Seminar</a>	3 SWS	Seminar (S)	Mädche
SS 2019	2550493	<a href="#">Hospital Management</a>	2 SWS	Block (B)	Hansis
SS 2019	2577915	<a href="#">Strategische Unternehmensführung</a>	2 SWS	Seminar (S)	Klopfer
SS 2019	2579904	<a href="#">Seminar Management Accounting</a>	2 SWS	Seminar (S)	Hammann, Disch
SS 2019	2579905	<a href="#">Special Topics in Management Accounting</a>	2 SWS	Seminar (S)	Mickovic, Riar
SS 2019	2581977	<a href="#">Seminar Produktionswirtschaft und Logistik II</a>	2 SWS	Seminar (S)	Schultmann
WS 19/20	2500006	<a href="#">Seminar Human Resource Management (Master)</a>	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2500007	<a href="#">Seminar Human Resources and Organizations (Master)</a>	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2500029	<a href="#">Seminar in Data Science for Finance</a>	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	<a href="#">Data Science in Service Management</a>	2 SWS	Seminar (S)	Haubner, Frankenhauser, Gröschel
WS 19/20	2540475	<a href="#">Electronic Markets &amp; User behavior</a>	2 SWS	Seminar (S)	Dorner, Knierim, Dann, Jaquart
WS 19/20	2540477	<a href="#">Digital Experience and Participation</a>	2 SWS	Seminar (S)	Straub, Peukert, Hoffmann, Kloker, Pasmaz, Willrich, Kloepper, Fegert, Greif-Winzrieth
WS 19/20	2540478	<a href="#">Smart Grids and Energy Markets</a>	2 SWS	Seminar (S)	Dinther, Staudt, Richter, Huber, vom Scheidt, Golla

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	3 SWS	Seminar (S)	Mädche
WS 19/20	2572181		2 SWS	Seminar (S)	Klarmann
WS 19/20	2573010	Seminar: Human Resources and Organizations (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2573011	Seminar: Human Resource Management (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 19/20	2577915	Strategische Unternehmensführung	2 SWS	Seminar (S)	Klopfer
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
<b>Exams</b>					
SS 2019	00019	Seminar Digital Service Innovation		Prüfung (PR)	Satzger
SS 2019	7500148	Proseminar: Practical Seminar: Interactive Analytics		Prüfung (PR)	Beigl, Mädche
SS 2019	7900008	Hospital Management		Prüfung (PR)	Nickel
SS 2019	7900017	Soziale Innovationen unter die Lupe genommen		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900052	Entrepreneurship Research		Prüfung (PR)	Terzidis
SS 2019	7900055	Roadmapping		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900093	Seminar in Business Administration A		Prüfung (PR)	Weinhardt
SS 2019	7900126	Seminar Strategic Management		Prüfung (PR)	Lindstädt
SS 2019	7900127	Seminar in Finance (Master)		Prüfung (PR)	Uhrig-Homburg
SS 2019	7900180	Seminar in Business Administration		Prüfung (PR)	Weinhardt
SS 2019	7900214	Seminar Business Data Analytics (Master)		Prüfung (PR)	Weinhardt
SS 2019	7900242	Applied Risk and Asset Management		Prüfung (PR)	Ulrich
SS 2019	7900244	Digital Service Design Seminar		Prüfung (PR)	Mädche
SS 2019	7900256	Seminar Electronic Markets & User Behavior		Prüfung (PR)	Weinhardt
SS 2019	7900261	Information Systems and Design (ISSD) Seminar		Prüfung (PR)	Mädche
SS 2019	7900262	Practical Seminar: Information Systems and Service Design / Seminarpraktikum: Information Systems und Service Design		Prüfung (PR)	Mädche
SS 2019	7900265	Interactive Analytics Seminar		Prüfung (PR)	Mädche
SS 2019	7900284	Digital Transformation and Business Models		Prüfung (PR)	Weissenberger-Eibl
SS 2019	79-2579904-02	Seminar Management Accounting (Master)		Prüfung (PR)	Wouters
SS 2019	79-2579905-02	Seminar Special Topics in Management Accounting (Master)		Prüfung (PR)	Wouters
SS 2019	7981976	Seminar in Production and Operations Management I		Prüfung (PR)	Schultmann
SS 2019	7981978	Seminar in Production and Operations Management III		Prüfung (PR)	Schultmann

SS 2019	7981979	<a href="#">Seminar Energy Economics I</a>	Prüfung (PR)	Fichtner
SS 2019	7981981	<a href="#">Seminar Energy Economics III</a>	Prüfung (PR)	Fichtner
WS 19/20	7900017	<a href="#">Seminar Smart Grid and Energy Markets</a>	Prüfung (PR)	Weinhardt
WS 19/20	7900159	<a href="#">Seminar in Marketing and Sales</a>	Prüfung (PR)	Klarmann
WS 19/20	7900163	<a href="#">Seminar Human Resource Management (Master)</a>	Prüfung (PR)	Nieken
WS 19/20	7900164	<a href="#">Seminar Human Resources and Organizations (Master)</a>	Prüfung (PR)	Nieken
WS 19/20	7900165	<a href="#">Seminar Digital Experience and Participation</a>	Prüfung (PR)	Weinhardt

### 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 Human Resource Management (Master)**  
2500006, SS 2019, 2 SWS, [Open in study portal](#)

Seminar (S)

### Notes


See Module Handbook


**Seminar Human Resources and Organizations (Master)**  
2500007, SS 2019, 2 SWS, [Open in study portal](#)

Seminar (S)

### Notes

See Module Handbook


**Automated Financial Advisory**  
2530372, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

### Learning Content

At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

### Workload

The total workload for this course is approximately 90 hours.

### Literature

Literature will be distributed during the first lecture.

**Seminar in Finance (Master, Prof. Uhrig-Homburg)**2530580, SS 2019, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)****Learning Content**

Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.

The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

**Workload**

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

**Literature**

Will be announced at the end of the foregoing semester.

**Masterseminar Big Data Mining in Finance**2540510, SS 2019, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****Literature****Literature:**

- Goodfellow, I., Bengio, Y., & Courville, A. (2017). Deep Learning. MIT Press.
- Jean, N., Burke, M., Xie, M., Davis, W. M., Lobell, D. B., & Ermon, S. (2016). Combining satellite imagery and machine learning to predict poverty. *Science*, 353(6301), 790-794.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. *Nature*, 521(7553), 436-444.
- Leskovec, J., Rajaraman, A., & Ullman, J. D. (2014). Mining of Massive Datasets. Cambridge University Press.
- Lopez De Prado, M. (2018). Advances in Financial Machine Learning. John Wiley & Sons

**Hospital Management**2550493, SS 2019, 2 SWS, Language: German, [Open in study portal](#)**Block (B)****Description**

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.

**Learning 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.

**Annotation**

It is planned to offer the course every semester.

**Workload**

The total workload for this course is approximately 90 hours.

**Seminar Management Accounting**2579904, SS 2019, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Notes**

see Module Handbook

**Learning 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.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

**Annotation**

Maximum of 24 students.

**Workload**

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

**Literature**

Will be announced in the course.

**Special Topics in Management Accounting**

2579905, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)****Notes**

see Module Handbook

**Learning 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 four meetings that are spread throughout the semester.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

**Annotation**

Maximum of 24 students.

**Workload**

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

**Literature**

Will be announced in the course.

**Seminar Human Resource Management (Master)**

2500006, WS 19/20, 2 SWS, [Open in study portal](#)

**Seminar (S)****Notes**

See Module Handbook

**Seminar Human Resources and Organizations (Master)**

2500007, WS 19/20, 2 SWS, [Open in study portal](#)

**Seminar (S)****Notes**

See Module Handbook

**Seminar in Data Science for Finance**2500029, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Description**

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.

**Learning Content**

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)****Notes**

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)****Workload**

The total workload for this course is approximately 90 hours (3 ECTS). Depending on the realization of the work, the times may vary. The main focus is always on working independently.

**Digital Service Design Seminar**2540559, WS 19/20, 3 SWS, [Open in study portal](#)**Seminar (S)****Description**

Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: "The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes." Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management**. The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

**Learning Content**

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

2572181, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)****Learning 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.

**Annotation**

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)

**Workload**

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

**Literature**

will be announced in the seminary.

**Seminar: Human Resources and Organizations (Bachelor)**

2573010, WS 19/20, 2 SWS, [Open in study portal](#)

**Seminar (S)****Notes**

See Module Handbook

**Seminar: Human Resource Management (Bachelor)**

2573011, WS 19/20, 2 SWS, [Open in study portal](#)

**Seminar (S)****Notes**

See Module Handbook

## T

**6.262 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				
SS 2019	7900051	<a href="#">Seminar in Economic Policy (Master)</a>	Prüfung (PR)	Ott
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 graded 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

**6.263 Course: Seminar in Economics A (Master) [T-WIWI-103478]****Responsible:** Professorenschaft des Fachbereichs Volkswirtschaftslehre**Organisation:** KIT Department of Economics and Management**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-102736 - Seminar Module Economic Sciences](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2019	2521310	<a href="#">Advanced Topics in Econometrics</a>	2 SWS	Seminar (S)	Schienze, Chen, Görden
SS 2019	2560282	<a href="#">Wirtschaftspolitisches Seminar</a>	2 SWS	Seminar (S)	Ott, Assistenten
SS 2019	2560552	<a href="#">Topics in Political Economics (Master)</a>	2 SWS	Seminar (S)	Szech, Maus
SS 2019	2560554	<a href="#">Morals and Social Behavior (Master)</a>	2 SWS	Seminar (S)	Szech, Huber
WS 19/20	2560140	<a href="#">Topics on Political Economics (Bachelor)</a>	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2560141	<a href="#">Morals &amp; Social Behavior (Bachelor &amp; Master)</a>	2 SWS	Seminar (S)	Huber, Ehrlich
WS 19/20	2560142	<a href="#">Topics on Political Economics (Master)</a>	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2561208	<a href="#">Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung</a>	1 SWS	Seminar (S)	Szimba
Exams					
SS 2019	7900051	<a href="#">Seminar in Economic Policy (Master)</a>		Prüfung (PR)	Ott
SS 2019	7900059	<a href="#">Seminar in Economics B (Master)</a>		Prüfung (PR)	Szech
SS 2019	7900060	<a href="#">Seminar in Economics B (Master)</a>		Prüfung (PR)	Szech
SS 2019	7900147	<a href="#">Seminar in Economics (Bachelor)</a>		Prüfung (PR)	Fuchs-Seliger
SS 2019	7900222	<a href="#">Seminar in Economics B (Master)</a>		Prüfung (PR)	Melik-Tangian
SS 2019	7900237	<a href="#">Seminar Strategic Decisions</a>		Prüfung (PR)	Ehrhart
SS 2019	7900266	<a href="#">Seminar in Macroeconomics I</a>		Prüfung (PR)	Scheffel
SS 2019	7900272	<a href="#">Seminar in Macroeconomics II</a>		Prüfung (PR)	Scheffel
SS 2019	7900282	<a href="#">Digital IT-Solutions and Services Transforming the Field of Public Transportation</a>		Prüfung (PR)	Mitusch
SS 2019	791192ee	<a href="#">Topics in Experimental Economics</a>		Prüfung (PR)	Reiß
SS 2019	79sefi2	<a href="#">Seminar Infrastructure and Science Networks A (Master)</a>		Prüfung (PR)	Wigger
WS 19/20	7900103	<a href="#">Data-driven innovation and science communication (Master)</a>		Prüfung (PR)	Ott
WS 19/20	7900132	<a href="#">Seminar in Economics A (Master)</a>		Prüfung (PR)	Fuchs-Seliger
WS 19/20	79sefi2	<a href="#">Seminar in Economics A (Master)</a>		Prüfung (PR)	Wigger

**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:*

**Advanced Topics in Econometrics**2521310, SS 2019, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Annotation**

The course will be offered in English.

**Topics in Political Economics (Master)**2560552, SS 2019, 2 SWS, Language: English, [Open in study portal](#)**Seminar (S)****Description**

In many companies relative reward schemes are used whereby employees earn a bonus if they perform better than their colleagues. Moreover, hierarchical structures mean that in many organizations, employees find themselves in constant competition for promotions. This is meant to provide incentives for higher performance. However, competitive remuneration schemes could also have detrimental effects such that individual workers may view their colleagues as direct competitors generating more selfish and/or less helpful behavior in the workplace. Furthermore, age, gender and culture seem to have impacts on willingness to compete. For example, in western cultures, adult men sometimes enter competition even though their performance level is way too low for success, i.e., they harm themselves by over-competitiveness. In contrast, adult females sometimes compete less than they could do successfully.

Another challenge in contest design, e.g. in sports, is that when competition takes place among workers with mixed abilities it may lead to a discouragement effect, which establishes that lower ability individuals often reduce effort competing against an individual they do not feel up to (e.g. it has been found that average golf players performed significantly worse when competing against a superstar like Tiger Woods). One solution suggested by the economic literature is to level the playing field between advantaged and disadvantaged individuals by favoring weaker individuals through bid-caps, asymmetric tie-breaking rules, or advances. In sports, asymmetric tie-breaking is already common, for instance, in the

Champions League soccer playoffs "away goals" become the decisive factor in determining the winning team in case of a tie.

Contests are not only a well-established mechanism for incentivizing workers but also for encouraging innovation and advancing R&D. Elements of research and innovation contests can be found in the procurement of various goods and services. For instance, the construction of new buildings, proposals in a venture capital firm or TV shows for entertainment companies all flow through a similar innovation process that involves the solicitation of bids from multiple potential suppliers and the preparation of a pilot or a proposal. In other cases, e.g., in lobbying contests, it is often discussed whether investments are beneficial or not. Some authors have argued that investments into lobbying should be capped in order to soften competition among asymmetrically strong interest groups (e.g. the lobbying industry versus consumers' interest groups). Of course, then the question arises whether such caps achieve the respective design goal or not.

In this seminar, we discuss questions like: How can we design workplaces and labor contracts to increase motivation and productivity? How can contests be used to foster innovation? Which role should social preferences play and how could they inspire specific contest designs? How should sport contests be engineered depending on the respective goals? How should we design lobbying contests?

Also related topics are very welcome!

**Notes**

Participation will be limited to 12 students.

**Annotation**

For further questions, please contact Patrick Maus ([Patrick.Maus@kit.edu](mailto:Patrick.Maus@kit.edu)).

**Workload**

About 90 hours

**Literature**

Charness, G., Kuhn, P. (2011) Lab labor: What can labor economists learn from the lab? Handbook of labor economics, 4, 229-330.

Cassar, A., Friedman, D. (2004) Economics lab: an intensive course in experimental economics. Routledge.

Croson, R., Gneezy, U. (2009). Gender differences in preferences. Journal of Economic literature, 47(2), 448-474.

Dechenaux, Emmanuel, Dan Kovenock, and Roman M. Sheremeta. "A survey of experimental research on contests, all-pay auctions and tournaments." Experimental Economics 18.4 (2015): 609-669.

**Morals and Social Behavior (Master)**

2560554, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)****Description**

For a long time, economists studied given markets and mechanisms to predict outcomes, future developments or generally the participants' behavior. In contrast, Market Design uses theory, empirical and experimental work to design markets which incentivize their participants in a way that leads to a "desirable" outcome. In this, the designer can have different objectives, for example: Maximizing efficiency, welfare or minimizing negative externalities.

Prominent applications of Market Design include, quite topical, Germany's auction of 5G mobile licenses and matching markets, where there are two large populations that need to be matched to one another (think of hospitals and interns, students and dorm rooms or kidney donors and receivers). In this seminar, we think about ways to either design new markets or how we could alter existing ones in a socially beneficial way. Alternatively, research ideas could focus on finding failures or shortcomings of ineffectively designed markets.

**Notes**

Participation will be limited to 12 students.

**Annotation**

For further questions, please contact David Huber ([david.huber@kit.edu](mailto:david.huber@kit.edu)).

**Workload**

About 90 hours.

**Topics on Political Economics (Bachelor)**

2560140, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)****Workload**

About 90 hours.

**Topics on Political Economics (Master)**

2560142, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)****Workload**

About 90 hours.

## T

**6.264 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-102233 - Further Examinations](#)  
[M-INFO-102822 - Seminar Module Informatics](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2019	2512300	<a href="#">Knowledge Discovery and Data Mining</a>	3 SWS		Sure-Vetter, Färber, Nguyen, Weller
SS 2019	2513306	<a href="#">Data Science &amp; Real-time Big Data Analytics</a>	2 SWS		Sure-Vetter, Riemer, Zehnder
SS 2019	2513400	<a href="#">Emerging Trends in Critical Information Infrastructures</a>	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2019	2595470	<a href="#">Seminar Service Science, Management &amp; Engineering</a>	2 SWS	Seminar (S)	Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm
WS 19/20	2400125	<a href="#">Security and Privacy Awareness</a>	2 SWS	Seminar (S)	Boehm, Seidel-Saul, Volkamer, Aldag, Gerber, Gottschalk
WS 19/20	2512301	<a href="#">Linked Data and the Semantic Web</a>	3 SWS		Sure-Vetter, Acosta Deibe, Käfer, Heling
WS 19/20	2512311	<a href="#">Real-World Challenges in Data Science and Analytics</a>	3 SWS		Sure-Vetter, Nickel, Weinhardt, Zehnder, Brandt
WS 19/20	2513500	<a href="#">Cognitive Automobiles and Robots</a>	2 SWS	Seminar (S)	Zöllner
WS 19/20	2595470	<a href="#">Seminar Service Science, Management &amp; Engineering</a>	3 SWS	Seminar (S)	Weinhardt, Satzger, Nickel, Fromm, Fichtner, Sure-Vetter
Exams					
SS 2019	7900090	<a href="#">Data Science &amp; Real-time Big Data Analytics</a>	Prüfung (PR)		Sure-Vetter
SS 2019	7900092	<a href="#">Seminar Service Science, Management &amp; Engineering</a>	Prüfung (PR)		Sure-Vetter
SS 2019	7900094	<a href="#">Knowledge Discovery and Data Mining</a>	Prüfung (PR)		Sure-Vetter
SS 2019	7900114	<a href="#">Selected Issues in Critical Information Infrastructures</a>	Prüfung (PR)		Sunyaev
SS 2019	7900187	<a href="#">Emerging Trends in Critical Information Infrastructures</a>	Prüfung (PR)		Sunyaev
WS 19/20	7900038	<a href="#">Linked Data and the Semantic Web</a>	Prüfung (PR)		Sure-Vetter
WS 19/20	7900044	<a href="#">Seminar Service Science, Management &amp; Engineering</a>	Prüfung (PR)		Sure-Vetter
WS 19/20	7900129	<a href="#">Security and Privacy Awareness</a>	Prüfung (PR)		Volkamer
WS 19/20	7900187	<a href="#">Real-World Challenges in Data Science und Analytics</a>	Prüfung (PR)		Sure-Vetter

**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:*

**Knowledge Discovery and Data Mining**

2512300, SS 2019, 3 SWS, Language: English, [Open in study portal](#)

**Description**

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.

**Notes**

The exact dates and information for registration will be announced at the event page.

**Learning Content**

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

**Literature**

Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- 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.

**Data Science & Real-time Big Data Analytics**

2513306, SS 2019, 2 SWS, Language: German/English, [Open in study portal](#)

**Description**

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.



### Seminar Service Science, Management & Engineering

2595470, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

#### Learning 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)

#### Workload

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

#### Literature

The student will receive the necessary literature for his research topic.



### Security and Privacy Awareness

2400125, WS 19/20, 2 SWS, [Open in study portal](#)

Seminar (S)

#### Notes

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.

Further information about the concrete topics will follow shortly.

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](#)

#### Notes

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](#)

#### Notes

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.



### Seminar Service Science, Management & Engineering

2595470, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Seminar (S)

#### Notes

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.



## 6.265 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-102736 - Seminar Module Economic Sciences](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2019	2550132	<a href="#">Seminar zur Mathematischen Optimierung (MA)</a>	2 SWS	Seminar (S)	Stein, Mohr, Neumann
SS 2019	2550473	<a href="#">Seminar on Power Systems Optimization (Master)</a>	2 SWS	Seminar (S)	Rebennack, Assistenten
SS 2019	2550491	<a href="#">Seminar zur diskreten Optimierung</a>	SWS	Block (B)	Nickel, Mitarbeiter
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
Exams					
SS 2019	00025	<a href="#">Seminar in Operations Research A (Master)</a>	Prüfung (PR)		Nickel
SS 2019	7900018_SS2019	<a href="#">Seminar in Operations Research A (Master)</a>	Prüfung (PR)		Stein
SS 2019	7900251	<a href="#">Seminar in Operations Research A (Master)</a>	Prüfung (PR)		Nickel

### 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 zur diskreten Optimierung

2550491, SS 2019, SWS, Language: German, [Open in study portal](#)

Block (B)



**Learning Content**

The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

**Annotation**

The seminar is offered in each term.

**Workload**

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

**Literature**

Literature and relevant sources will be announced at the beginning of the seminar.

**Seminar: Modern OR and Innovative Logistics**

2550491, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Learning Content**

The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Dates will be announced on the internet.

**Annotation**

The seminar is offered in each term.

**Workload**

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

**Literature**

Literature and relevant sources will be announced at the beginning of the seminar.

## T

**6.266 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-102736 - Seminar Module Economic Sciences](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2019	2521310	<a href="#">Advanced Topics in Econometrics</a>	2 SWS	Seminar (S)	Schienle, Chen, Görden
Exams					
SS 2019	7900150	<a href="#">Advanced Topics in Econometrics, Seminar in Statistics A (Master)</a>	Prüfung (PR)		Schienle
SS 2019	7900250	<a href="#">Data Mining and Applications (Projectseminar)</a>	Prüfung (PR)		Nakhaeizadeh

**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 2019, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Annotation**

The course will be offered in English.

## T

**6.267 Course: Seminar Informatics A [T-INFO-104336]**

**Responsible:** Prof. Dr. Sebastian Abeck  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-INFO-102822 - Seminar Module Informatics](#)

Type	Credits	Version
Examination of another type	3	1

Events					
SS 2019	2400011	<a href="#">Hot Topics in Bioinformatics</a>	2 SWS	Seminar (S)	Stamatakis
SS 2019	24344	<a href="#">Advanced Methods of Information Fusion</a>	2 SWS	Seminar (S)	Hanebeck, Radtke
WS 19/20	24844	<a href="#">Seminar: Ubiquitous Systems</a>	2 SWS	Seminar (S)	Beigl, Pescara
Exams					
SS 2019	7500013	<a href="#">Advanced Methods of Information Fusion</a>	Prüfung (PR)		Hanebeck, Noack
SS 2019	7500014	<a href="#">Seminar: Hot Topics in Bioinformatics</a>	Prüfung (PR)		Stamatakis
SS 2019	7500040	<a href="#">Seminar Information Systems</a>	Prüfung (PR)		Böhm
SS 2019	7500106	<a href="#">Title not available</a>	Prüfung (PR)		Bless, Hartenstein, Mädchen, Zitterbart, Boehm, Sunyaev
SS 2019	7500148	<a href="#">Proseminar: Practical Seminar: Interactive Analytics</a>	Prüfung (PR)		Beigl, Mädchen
SS 2019	7500149	<a href="#">Seminar: Designing and Conducting Experimental Studies</a>	Prüfung (PR)		Beigl
SS 2019	7500162	<a href="#">Seminar: Ubiquitous Systems</a>	Prüfung (PR)		Beigl, Riedel
SS 2019	7500198	<a href="#">Seminar in Security</a>	Prüfung (PR)		Geiselmann, Müller-Quade, Hofheinz
SS 2019	7500199	<a href="#">Seminar in Cryptography</a>	Prüfung (PR)		Geiselmann, Müller-Quade, Hofheinz
WS 19/20	7500021	<a href="#">Advanced Methods of Information Fusion</a>	Prüfung (PR)		Hanebeck
WS 19/20	7500220	<a href="#">Seminar Ubiquitous Computing</a>	Prüfung (PR)		Beigl

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

## V

**Advanced Methods of Information Fusion**

24344, SS 2019, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)**

**Learning Content**

- The students will research selected theoretical works of the field of information fusion and data analysis, and present the results to their colleagues.
- The Seminar will prepare the students to write their Master thesis.
- Moreover, the students will learn to work with LaTeX and Powerpoint.

**T****6.268 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**  
 Examination of another type

**Credits**  
 3

**Version**  
 1

Events					
SS 2019	2400041	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar (S)	Herzig
Exams					
SS 2019	7500140	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Dreier, Matz, Boehm

**T****6.269 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	1

Events					
SS 2019	2400041	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar (S)	Herzig
SS 2019	2400061	<a href="#">Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung</a>	2 SWS	Seminar (S)	Bless, Boehm, Hartenstein, Mädche, Sunyaev, Zitterbart
SS 2019	24820	<a href="#">Current Issues in Patent Law</a>	2 SWS	Seminar (S)	Melullis
WS 19/20	24389	<a href="#">IT-Sicherheit und Recht</a>	2 SWS	Seminar (S)	Schallbruch
Exams					
SS 2019	7500106	<a href="#">Title not available</a>		Prüfung (PR)	Bless, Hartenstein, Mädche, Zitterbart, Boehm, Sunyaev
SS 2019	7500140	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Dreier, Matz, Boehm
SS 2019	7500159	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Marsch

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

**V****Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung**

Seminar (S)

2400061, SS 2019, 2 SWS, [Open in study portal](#)**Notes**

Registration via <https://portal.wiwi.kit.edu/ys/2708>

## T

**6.270 Course: Service Analytics A [T-WIWI-105778]**

**Responsible:** Prof. Dr. Hansjörg Fromm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101448 - Service Management](#)  
[M-WIWI-101470 - Data Science: Advanced CRM](#)  
[M-WIWI-101506 - Service Analytics](#)  
[M-WIWI-103117 - Data Science: Data-Driven Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

Events					
SS 2019	2595501	<a href="#">Service Analytics A</a>	2 SWS	Lecture (V)	Fromm, Setzer
SS 2019	2595502	<a href="#">Übung zu Service Analytics A</a>	1 SWS	Practice (Ü)	Baier, Kühl
Exams					
SS 2019	7900220	<a href="#">Service Analytics A</a>		Prüfung (PR)	Fromm, Setzer
SS 2019	7900293	<a href="#">Service Analytics A</a>		Prüfung (PR)	Fromm, Setzer
WS 19/20	7900086	<a href="#">Service Analytics A</a>		Prüfung (PR)	Fromm

**Competence Certificate**

The assessment consists of a written exam (60 min) according to §4(2), 1 of the examination regulations.

**Prerequisites**

None

**Recommendation**

The lecture is addressed to students with interests and basic knowledge in the topics of Operations Research, descriptive and inductive statistics.

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

## V

**Service Analytics A**

2595501, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

Today's service-oriented companies are starting to optimize the way services are planned, operated, and personalized by analyzing vast amounts of data from customers, IT-systems, or sensors. As the statistical learning and business optimization world continues to progress, skills and expertise in advanced data analytics and data and fact-based optimization become vital for companies to be competitive. In this lecture, relevant methods and tools will be considered as a package, with a strong focus on their inter-relations. Students will learn to analyze and structure large amounts of potentially incomplete and unreliable data, to apply multivariate statistics to filter data and to extract key features, to predict future behavior and system dynamics, and finally to formulate data and fact-based service planning and decision models.

More specifically, the lessons of this lecture will include:

- Co-Creation of Value Across Enterprises
- Instrumentation, Measurement, Monitoring of Service Systems
- Descriptive, predictive, and prescriptive Analytics
- Usage Characteristics and Customer Dynamics
- Big Data, Dimensionality Reduction, and Real-Time Analytics
- System Models and What-If-Analysis
- Robust Mechanisms for Service Management
- Industry Applications of Service Analytics

**Tutorials**

Students will conduct lecture accompanying, guided exercises throughout the semester.

**Workload**

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

**Literature**

- The Geometry of Multivariate Statistics, Wickens, T. D., Psychology Press, 2014.
- Data Mining: Concepts and Techniques, Han, J., Pei, J., Kamber, M., Elsevier, 2011.
- Data Mining and Analysis, Zaki, M. J., Meira Jr, W., Meira, W., Cambridge University Press, 2014.
- An Introduction to Statistical Learning with Applications in R, James, G. et al., Springer, 2013.
- Forecasting – Principles and Practice, Hyndman, R. J., Athanasopoulos, G., OTexts, 2018.
- Fundamentals of Predictive Text Mining, Weiss S. M. et al., Springer, 2015.

**Paper:**

- How Big Data can make Big Impact: Findings from a systematic review and a longitudinal case study. International Journal of Production Economics, 2015.
- Business Intelligence and Analytics: from Big Data to Big Impact, Chen, H. et al., MIS quarterly, 2012.
- Building Watson – An Overview of the DeepQA Project, Ferrucci, D. et al., AI Magazine, 2010.

Further readings will be provided in the lecture.

## T

**6.271 Course: Service Design Thinking [T-WIWI-102849]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101503 - Service Design Thinking](#)

Type	Credits	Recurrence	Version
Examination of another type	12	Irregular	3

Exams				
SS 2019	7900217	<a href="#">Service Design Thinking</a>	Prüfung (PR)	Satzger

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

The course is compulsory and must be examined.

**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

**6.272 Course: Service Innovation [T-WIWI-102641]**

**Responsible:** Prof. Dr. Gerhard Satzger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2595468	<a href="#">Service Innovation</a>	2 SWS	Lecture (V)	Satzger
Exams					
SS 2019	7900221	<a href="#">Service Innovation</a>		Prüfung (PR)	Satzger

**Competence Certificate**

The assessment consists of an 1h written exam and of assignments during the course.

**Prerequisites**

None

**Recommendation**

None

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

## V

**Service Innovation**

2595468, SS 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Description**

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

**Learning Content**

While innovation in manufacturing 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 and understand how innovation diffusion works. We examine case studies on service innovation, compare open vs. closed innovation and learn how to apply different innovation tools, methods and strategies (e.g. service design thinking as a human-centered approach to innovation or technology and strategic foresight, as methods supporting the generation of assumptions on the impact of technology).

**Annotation**

The credits have been changed from 5 to 4,5.

**Workload**

Total workload: approximately 136 hours

Attendance time: 30 hours

Self-study: 105 hours

**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.
- Uebernickel, 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

**6.273 Course: Signals and Codes [T-INFO-101360]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101197 - Computer Security](#)  
[M-INFO-101198 - Advanced Topics in Cryptography](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each winter term	1

Events					
WS 19/20	24137	<a href="#">Signals and Codes</a>	2 SWS	Lecture (V)	Geiselmann, Müller-Quade
Exams					
SS 2019	7500179	<a href="#">Signals and Codes</a>		Prüfung (PR)	Geiselmann, 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)**

**Learning Content**

The course covers essentially the question of how the exchange of information can be realized reliably and efficiently. The lecture gives an overview of how to secure signals against random errors. In signal theory, source coding and the Theorem of Shannon will be covered. In the coding theory part, 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.



## 6.274 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 2019	2581025	<a href="#">Simulation Game in Energy Economics</a>	2 SWS	Lecture / Practice (VÜ)	Genoese
Exams					
SS 2019	7981025	<a href="#">Simulation Game in Energy Economics</a>		Prüfung (PR)	Fichtner

### 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:*



### Simulation Game in Energy Economics

2581025, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

### Learning 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.

### Workload

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

### Literature

#### Elective literature:

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****6.275 Course: Simulation of Stochastic Systems [T-WIWI-106552]**

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

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

**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-103289 - Stochastic Optimization](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	1

**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

**6.276 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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.

## T

## 6.277 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	1

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

**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

**6.278 Course: Social Choice Theory [T-WIWI-102859]**

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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 2019	2520537	<a href="#">Social Choice Theory</a>	2 SWS	Lecture (V)	Puppe, Müller
SS 2019	2520539	<a href="#">Übung zu Social Choice Theory</a>	1 SWS	Practice (Ü)	Puppe, Müller
Exams					
SS 2019	7900239	<a href="#">Social Choice Theory</a>		Prüfung (PR)	Puppe
SS 2019	7900240	<a href="#">Social Choice Theory</a>		Prüfung (PR)	Puppe

**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 2019, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Learning Content**

The course provides a comprehensive treatment of preference and judgement aggregation, including proofs of general results that have Arrow's famous impossibility theorem and Gibbard's oligarchy theorem as corollaries. The second part of the course is devoted to voting theory. Among other things, we prove the Gibbard-Satterthwaite theorem.

**Workload**

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

**Literature**

Main texts:

- Hervé 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.

Secondary texts:

- 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

**6.279 Course: Sociotechnical Information Systems Development [T-WIWI-109249]**

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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
Exams					
SS 2019	7900016	<a href="#">Sociotechnical Information Systems Development</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)**

**Notes**

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

## T

**6.280 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2019	24667	<a href="#">Software Architecture and Quality</a>	2 SWS	Lecture (V)	Reussner
Exams					
SS 2019	7500021	<a href="#">Software Architecture and Quality</a>		Prüfung (PR)	Reussner
WS 19/20	7500032	<a href="#">Software Architecture and Quality</a>		Prüfung (PR)	Reussner

**T****6.281 Course: Software Development for Modern, Parallel Platforms [T-INFO-101339]**

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101201 - Software Systems](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2019	24660	<a href="#">Softwareentwicklung für moderne, parallele Plattformen</a>	2 SWS	Lecture (V)	Tichy, Tillmann
Exams					
SS 2019	7500246	<a href="#">Software Development for Modern, Parallel Platforms</a>		Prüfung (PR)	Tichy

## T

**6.282 Course: Software Quality Management [T-WIWI-102895]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2511208	<a href="#">Software Quality Management</a>	2 SWS	Lecture (V)	Oberweis
SS 2019	2511209	<a href="#">Übungen zu Software-Qualitätsmanagement</a>	1 SWS	Practice (Ü)	Oberweis, N.N.
Exams					
SS 2019	7900031	<a href="#">Software Quality Management</a>		Prüfung (PR)	Oberweis
WS 19/20	7900027	<a href="#">Software Quality Management</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

**Annotation**

This course was formerly named "Software Technology: Quality Management".

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

## V

**Software Quality Management**

2511208, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning 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.

**Annotation**

This course was formerly named "Software Technology: Quality Management".

**Workload**

Lecture 30h

Exercise 15h

Preparation of lecture 30h

Preparation of exercises 30h

Exam preparation 44h

Exam 1h

Total: 150h

### 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

Further literature is given in lectures.

## T

## 6.283 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500023	<a href="#">Software-Evolution</a>		Prüfung (PR)	Reussner
WS 19/20	7500004	<a href="#">Software-Evolution</a>		Prüfung (PR)	Reussner

## T

**6.284 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					
SS 2019	7900103	<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)****Notes**

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 Content**

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

**Workload**

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

**Literature**

Steven Brakman, Harry Garretsen, Charles van Marrewijk (2009), The New Introduction to Geographical Economics

Further literature recommendations will be announced in the course of the lecture.



## T

**6.285 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				
SS 2019	7900224	<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****6.286 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-INFO-102233 - Further Examinations](#)  
[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="#">Statistische Modellierung von Allgemeinen Regressionsmodellen</a>	2 SWS	Lecture (V)	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****Statistische Modellierung von Allgemeinen Regressionsmodellen**

2521350, WS 19/20, 2 SWS, [Open in study portal](#)

**Lecture (V)****Annotation**

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

**Workload**

The total workload for this course is approximately 135 hours (4.5 credits).

regular attendance: 30 hours

self-study: 65 hours

exam preparation: 40 hours

## T

**6.287 Course: Stochastic Calculus and Finance [T-WIWI-103129]**

**Responsible:** Dr. Mher Safarian  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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

**Competence Certificate**

The assessment of this course consists of a written examination (§4(2), 1 SPOs, 180 min.) and of possible additional assignments during the course (§4 (3) SPO).

**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)**

**Description**

The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus. Stochastic Processes, Brownian Motion and Martingales, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes. Stable and tempered stable processes. 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), Option pricing with tempered stable and Levy-Processes and volatility clustering, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem), Equilibrium models, Consumption-Based CAPM, Numerical Methods.

**Learning Content**

The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus. Stochastic Processes, Brownian Motion and Martingales, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes. Stable and tempered stable processes. 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), Option pricing with tempered stable and Levy-Processes and volatility clustering, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem), Equilibrium models, Consumption-Based CAPM, Numerical Methods.

Stochastic processes (Poisson-process, Brownian motion, martingales), stochastic Integral (Integral, quadratic und co-variation, Ito-formula), stochastic differential equation for price-processes, trading strategies, option pricing(Feynman-Kac), neutral risk rating(equivalent martingale measure, Girsanov theorem), term structure models

**Workload**

The total workload for this course is approximately 150 hours. For further information see German version.

**Literature**

To be announced in lecture.

**Elective literature:**

- Dynamic Asset Pricing Theory, Third Edition. by Darrell Duffie, Princeton University Press, 1996
- Stochastic Calculus for Finance II: Continuous-Time Models, by Steven E. Shreve, Springer, 2003
- An Introduction to Stochastic Integration (Probability and its Applications) by Kai L. Chung, Ruth J. Williams, Birkhaueser,
- Methods of Mathematical Finance by Ioannis Karatzas, Steven E. Shreve, Springer 1998
- Kim Y.S., Rachev S.T., Bianchi M-L, Fabozzi F. Financial market models with Levy processes and time-varying volatility, Journal of Banking and Finance, 32/7, 1363-1378, 2008.
- Hull, J., Options, Futures, & Other Derivatives, Prentice Hall, Sixth Edition, (2005).

**T****6.288 Course: Strategic Finance and Technology 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.

**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.



## 6.289 Course: Strategic Management of Information Technology [T-WIWI-102669]

**Responsible:** Thomas Wolf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101477 - Development of Business Information Systems](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	2

Events					
SS 2019	2511602	<a href="#">Strategic Management of Information Technology</a>	2 SWS	Lecture (V)	Wolf
SS 2019	2511603	<a href="#">Übungen zu Strategisches Management der betrieblichen Informationsverarbeitung</a>	1 SWS	Practice (Ü)	Wolf
Exams					
SS 2019	7900034	<a href="#">Strategic Management of Information Technology</a>		Prüfung (PR)	Wolf
WS 19/20	7900030	<a href="#">Strategic Management of Information Technology</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

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



### Strategic Management of Information Technology

2511602, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Learning Content

The following topics will be covered: strategic planing of ICT, architecture of ICT, overall planning of ICT, outsourcing, operation and controlling of ICT.

### Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995
- Heinrich, L. J., Burgholzer, P.: Informationsmanagement, Planung, Überwachung, Steuerung d. Inform.-Infrastruktur. Oldenbourg, München 1990
- Nolan, R.: Managing the crises in data processing. Harvard Business Review, Vol. 57, Nr. 2 1979
- Österle, H. et al.: Unternehmensführung und Informationssystem. Teubner, Stuttgart 1992
- Thome, R.: Wirtschaftliche Informationsverarbeitung. Verlag Franz Vahlen, München 1990

**T****6.290 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**  
Examination of another type

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Events					
WS 19/20	2577921	<a href="#">Strategy and Management Theory: Developments and "Classics" (Master)</a>	2 SWS	Seminar (S)	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)****Notes**

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.

**Learning 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.

**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**T****6.291 Course: Subdivision Algorithms [T-INFO-103550]**

**Responsible:** Prof. Dr. Hartmut Prautzsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101214 - Algorithms in Computer Graphics](#)  
[M-INFO-101864 - Subdivision Algorithms](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Oral examination	5	Irregular	1



**T****6.292 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****6.293 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-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	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)**

**Learning 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

**Annotation**

None.

**Workload**

The total workload for this course is approximately 105.0 hours. For further information see German version.

**Literature**

Will be announced in the course.

**T****6.294 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-INFO-102233 - Further Examinations](#)  
[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 2019	2581961	<a href="#">Supply Chain Management with Advanced Planning Systems</a>	2 SWS	Lecture (V)	Göbelt, Bosch
Exams					
SS 2019	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 2019, 2 SWS, Language: English, [Open in study portal](#)**Lecture (V)****Learning Content****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
- 3.4. Production Planning and Detailed Scheduling
- 3.5. Deployment
- 3.6. Transportation Planning and Vehicle Scheduling
- 3.7. [Optional] Global Available to Promise

**4. SAP SCM in Practice**

- 4.1. Success Stories
- 4.2. SAP Implementation Methodology

**Annotation**

This lecture has 3,5 Credits since summer term 2014.

**Workload**

The total workload for this course is approximately 105 hours. For further information see German version.

**Literature**

will be announced in the course

## T

**6.295 Course: Symmetric Encryption [T-INFO-101390]**

**Responsible:** Prof. Dr. Jörn Müller-Quade  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101197 - Computer Security](#)  
[M-INFO-101198 - Advanced Topics in Cryptography](#)  
[M-INFO-101207 - Networking Security - Theory and Praxis](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Oral examination

**Credits**  
3

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	24629	<a href="#">Symmetric encryption</a>	2 SWS	Lecture (V)	Müller-Quade, Geiselmann
Exams					
SS 2019	7500070	<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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

This lecture provides the theoretical and practical aspects of symmetric cryptography. The most important topics are:

- Historical ciphers, if they are useful for assessing the security of current ciphers,
- block ciphers and the most important types of attacks (differential and linear cryptanalysis, meet-in-the-middle attacks, slide attacks),
- hash functions - the focus is on attacks and techniques to forge meaningful messages through the use of "meaningless collisions",
- security definitions for symmetric encryption schemes and their modes of operation.

## T

**6.296 Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]****Responsible:** Prof. Dr. Stefan Nickel**Organisation:** KIT Department of Economics and Management**Part of:** [M-INFO-102233 - Further Examinations](#)[M-WIWI-102832 - Operations Research in Supply Chain Management](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	3

Events					
SS 2019	2550486	<a href="#">Taktisches und operatives SCM</a>	2 SWS	Lecture (V)	Nickel
SS 2019	2550487	<a href="#">Übungen zu Taktisches und operatives SCM</a>	1 SWS	Practice (Ü)	Pomes
Exams					
SS 2019	00026	<a href="#">Tactical and Operational Supply Chain Management</a>		Prüfung (PR)	Nickel

**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.

Prerequisite for admission to examination is the succesful completion of the online assessments.

**Prerequisites**

Prerequisite for admission to examination is the succesful completion of the online assessments.

**Recommendation**

None

**Annotation**

The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

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

## V

**Taktisches und operatives SCM**

2550486, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Description**

Since the classical work 'Theory of the Location of Industries' of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. 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 allows an efficient flow of materials and leads to lower costs and increased customer service.

Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

**Learning Content**

The lecture covers basic quantitative methods in location planning in the context of strategic Supply Chain Planning. Besides the discussion of several criteria for the evaluation of the locations of facilities, the students are acquainted with classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models). The exercises accompanying the lecture offer the possibility to apply the considered models to practical problems.

**Annotation**

The lecture is held in every summer term. The planned lectures and courses for the next three years are announced online.

**Literature**

**Elective Literature**

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005



## 6.297 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500052	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500066	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz



## T

## 6.298 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](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	24646	<a href="#">Tax Law II</a>	2 SWS	Lecture (V)	Dietrich
Exams					
SS 2019	7500053	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500067	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz

**T****6.299 Course: Technical Conditions Met [T-WIWI-106623]****Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101453 - Applied Strategic Decisions](#)

Type	Credits	Recurrence	Version
Completed coursework	0	Each term	1

**Competence Certificate**

This module element is intended to record the Bachelor-examination "Introduction to Game Theory". In the master module M-WIWI-101453 "Applied Strategic Decisions", this means that the obligatory course "Advanced Game Theory" is not required.

**Prerequisites**

None

## T

**6.300 Course: Technologies for Innovation Management [T-WIWI-102854]**

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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="#">Technologien für das Innovationsmanagement</a>	2 SWS	Block (B)	Koch

**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

**Technologien für das Innovationsmanagement**

2545106, WS 19/20, 2 SWS, [Open in study portal](#)

**Block (B)**

**Learning 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**

Will be announced in the first session.

## T

## 6.301 Course: Technology Assessment [T-WIWI-102858]

**Responsible:** Dr. Daniel Jeffrey Koch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101507 - Innovation Management](#)  
[M-WIWI-101507 - Innovation Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each summer term	1

**Competence Certificate**

Alternative exam assessment.

**Prerequisites**

None

**Recommendation**

Prior attendance of the course Innovation Management is recommended.

**Annotation**

See German version.



## 6.302 Course: Telecommunication and Internet Economics [T-WIWI-102713]

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900276	<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:*



## Telecommunication and Internet Economics

2561232, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Learning Content

Among the network sectors the telecommunication and internet sector is the most dynamic one and the one with and highest variety of phenomena. Problems of natural monopoly still exist in some parts. But there is also competition, not only at the service level but also at the infrastructural level. Both levels are characterized by (vertical) quality differentiations and by high technology dynamics. What should the regulation of this sector look like? How should the mutual network access prices of two telecommunication providers be regulated and how can regulators set incentives for infrastructure investments?

The internet is a free market par excellence, because everybody can open internet businesses without high entry costs. Why then can a company like ebay dominate the market for internet-auction platforms so strongly? The causes of market concentration on the internet will be analyzed. So will be the economic implications of the Next Generations Networks.

### Workload

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

### Literature

J.-J. Laffont, J. Tirole (2000): Competition in Telecommunications, MIT Press.

Zarnekow, Wulf, Bronstaedt (2013): Internetwirtschaft: Das Geschäft des Datentransports im Internet.

Further literature will be provided during the lecture

## T

## 6.303 Course: Telecommunications Law [T-INFO-101309]

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)  
[M-INFO-102233 - Further Examinations](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	24632	<a href="#">Telekommunikationsrecht</a>	2 SWS	Lecture (V)	Hermstrüwer
Exams					
SS 2019	7500085	<a href="#">Telecommunications Law</a>		Prüfung (PR)	Marsch

## T

## 6.304 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](#)  
[M-INFO-102233 - Further Examinations](#)

**Type**  
Written examination

**Credits**  
6

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24128	<a href="#">Telematics</a>	3 SWS	Lecture (V)	Bauer, Friebe, Heseding, Hock, Zitterbart
Exams					
SS 2019	7500115	<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)

## Description

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

## T

**6.305 Course: Theory of Endogenous Growth [T-WIWI-102785]**

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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
Exams					
SS 2019	7900105	<a href="#">Theory of Endogenous Growth</a>		Prüfung (PR)	Ott

**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, [Open in study portal](#)

Lecture (V)

**Learning Content**

- Basic models of endogenous growth
- Human capital and economic growth
- Modelling of technological progress
- Diversity Models
- Schumpeterian growth
- Directional technological progress
- Diffusion of technologies

**Workload**

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



**Literature**

Excerpt:

- Acemoglu, D. (2008): 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

## 6.306 Course: Topics in Experimental Economics [T-WIWI-102863]

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101505 - Experimental Economics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Exams				
SS 2019	791192ee	<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

## 6.307 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](#)  
[M-INFO-102233 - Further Examinations](#)

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					
SS 2019	7500051	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz
WS 19/20	7500061	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz

## T

**6.308 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**  
Written examination

**Credits**  
4,5

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	2560230	<a href="#">Transport Economics</a>	SWS	Lecture (V)	Mitusch, Szimba
SS 2019	2560231	<a href="#">Übung zu Transportökonomie</a>	SWS	Practice (Ü)	Mitusch, Wisotzky, Szimba
Exams					
SS 2019	7900275	<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 2019, SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Learning Content**

The course shall provide an overview of transport economics. It will be demonstrated, using new microeconomic models, which impacts regulation and pricing in transport have on the economic actions of individuals and logisticians and which benefits and costs apply. The following topics will be discussed:

- demand and supply in transport
- empirical analysis of transport demand
- assessment of transport infrastructure projects
- external effects in transport
- transport policy
- cost structures of transport infrastructure
- Project evaluation from the perspective of the public sector

**Workload**

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

**Literature**

Will be announced in the lecture.

(for literature to prepare the lecture - see additional literature)

**Literature:**

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 [http://ec.europa.eu/regional\\_policy/sources/Ben-Akiva](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.

Ortúzar, J. d. D. and Willumsen, L. (1990): Modelling Transport.

## T

## 6.309 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-INFO-102233 - Further Examinations](#)  
[M-WIWI-101458 - Ubiquitous Computing](#)

**Type**  
Oral examination

**Credits**  
5

**Recurrence**  
Each winter term

**Version**  
1

Events					
WS 19/20	24146	<a href="#">Ubiquitäre Informationstechnologien</a>	2+1 SWS	Lecture / Practice (VÜ)	Beigl
Exams					
SS 2019	7500122	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl
SS 2019	7500122_191021	<a href="#">Ubiquitous Computing</a>		Prüfung (PR)	Beigl

## T

**6.310 Course: Valuation [T-WIWI-102621]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[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					
SS 2019	7900072	<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)

**Description**

Firms prosper when they create value for their shareholders and stakeholders. This is achieved by investing in projects that yield higher returns than their according cost of capital. Students are told the basic tools for firm and project valuation as well as ways to implement these tools in order to enhance a firm's value and improve its investment decisions. Among other things, the course will deal with the valuation of firms and individual projects using discounted cash flow and relative valuation approaches and the valuation of flexibility deploying real options.

**Learning Content**

Topics:

- Projections of cash flows
- Estimation of the cost of capital
- Valuation of the firm
- Mergers and acquisitions
- Real options

**Literature****Elective Literature**

Titman/Martin (2013): *Valuation - The Art and Science of Corporate Investment Decisions*, 2nd. ed. Pearson International.

## T

**6.311 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 2019	2400062	<a href="#">Wearable Robotic Technologies</a>	2 SWS	Lecture (V)	Asfour, Beigl, Beil
Exams					
SS 2019	7500219	<a href="#">Wearable Robotic Technologies</a>		Prüfung (PR)	Asfour
WS 19/20	7500073	<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 2019, 2 SWS, Language: German/English, [Open in study portal](#)

**Lecture (V)**

**Learning 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.

**Workload**

120h



**T****6.312 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**  
Oral examination

**Credits**  
4

**Recurrence**  
Each summer term

**Version**  
1

Events					
SS 2019	24677	<a href="#">Web Applications and Service oriented Architectures (II)</a>	2 SWS	Lecture (V)	Abeck
Exams					
SS 2019	7500138	<a href="#">Web Applications and Service-oriented Architectures (II)</a>		Prüfung (PR)	Abeck

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

**V****Web Applications and Service oriented Architectures (II)**

24677, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Notes**

*Students, who want to take the oral exam of Prof. Abeck, must be present in the first lecture appointment on Wednesday, 26.04.2017 at 9:45 in seminar room 301.*

## T

**6.313 Course: Web Science [T-WIWI-103112]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-INFO-102233 - Further Examinations](#)  
[M-WIWI-101455 - Web Data Management](#)  
[M-WIWI-101457 - Semantic Technologies](#)  
[M-WIWI-102827 - Service Computing](#)

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					
SS 2019	7900032	<a href="#">Web Science</a>		Prüfung (PR)	Sure-Vetter
WS 19/20	7900031	<a href="#">Web Science</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

**Annotation**

New course starting winter term 2015/2016.

*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)

**Notes**

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

**Exercises to Web Science**

2511313, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Notes**

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.

**T****6.314 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					
SS 2019	2577912	<a href="#">Workshop Business Wargaming - Analyzing Strategic Interactions</a>	2 SWS	Seminar (S)	Lindstädt
WS 19/20	2577922	<a href="#">Workshop Business Wargaming - Analyse strategischer Interaktionen (Master)</a>	2 SWS	Seminar (S)	Lindstädt
Exams					
SS 2019	7900071	<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 - Analyzing Strategic Interactions****Seminar (S)**

2577912, SS 2019, 2 SWS, Language: German, [Open in study portal](#)

**Notes**

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.

**Learning Content**

In this course, students simulate and analyze real-life conflict situations using Business Wargaming methods. The students will be able to understand the underlying structure and dynamics of various conflicts, this includes making own conclusions as well as deriving strategic recommendations.

**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**Workshop Business Wargaming - Analyse strategischer Interaktionen (Master)**

Seminar (S)

2577922, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)**Learning 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.

**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.

**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

**T****6.315 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**  
Examination of another type

**Credits**  
3

**Recurrence**  
Irregular

**Version**  
1

Events					
SS 2019	2577923	<a href="#">Workshop aktuelle Themen Strategie und Management (Master)</a>	2 SWS	Seminar (S)	Lindstädt
Exams					
SS 2019	7900122	<a href="#">Workshop Current Topics in Strategy and Management</a>		Prüfung (PR)	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 2019, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Notes**

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.

**Learning 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.

**Workload**

The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a