

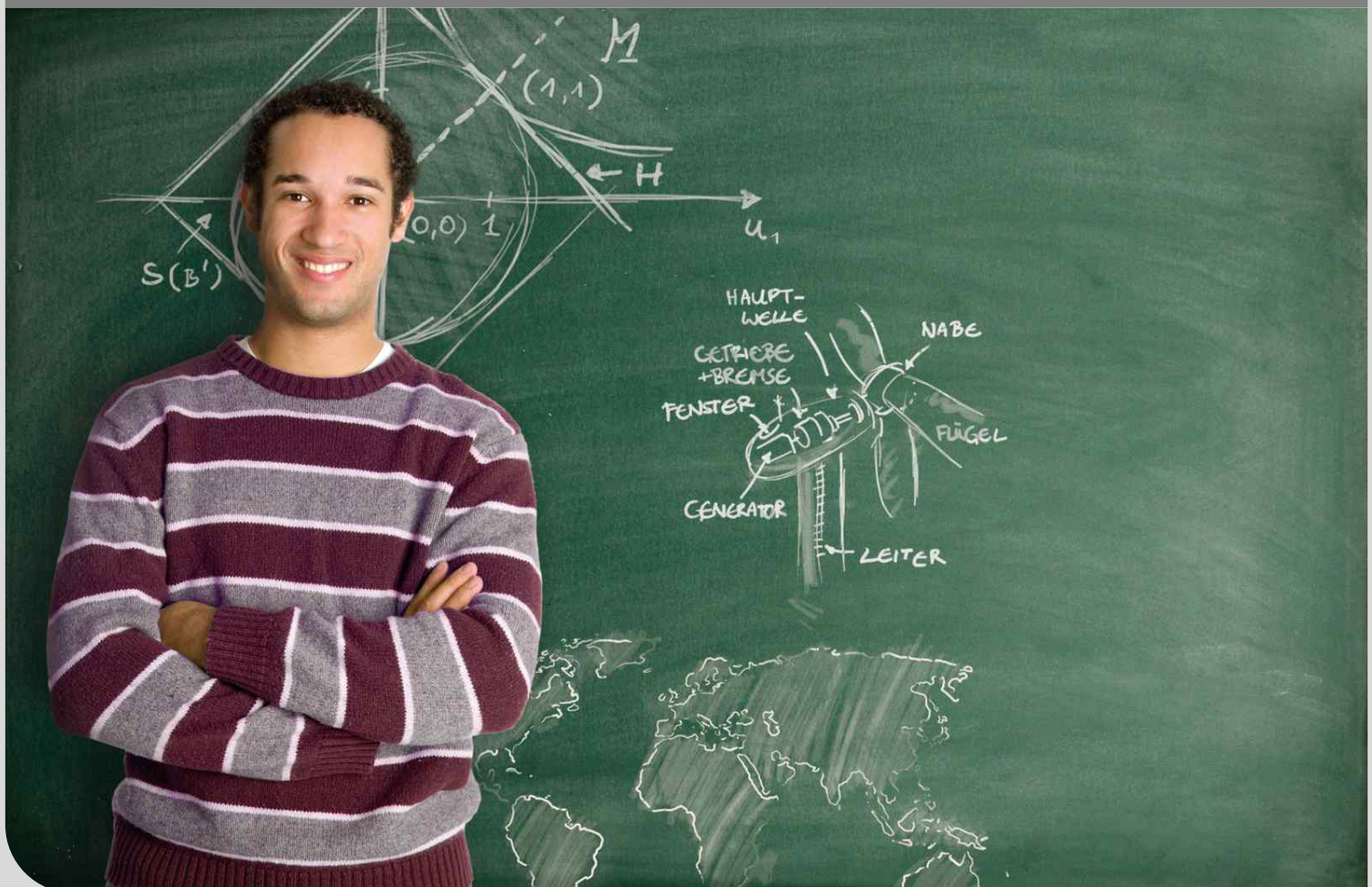
# Module Handbook Economics Engineering B.Sc.

SPO 2015

Summer term 2020

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KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT



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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.



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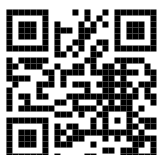
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<https://www.wiwi.kit.edu/>



## 2 About this handbook

### 2.1 Notes and rules

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

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

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

#### 2.1.1 Begin and completion of a module

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

#### 2.1.2 Module versions

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

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

#### 2.1.3 General and partial examinations

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

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

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

#### 2.1.4 Types of exams

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

#### 2.1.5 Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can be repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a

second repetition has to be made in written form to the examination committee two months after losing the examination claim. A counseling interview is mandatory.

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

### 2.1.6 Examiners

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

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

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

### 2.1.8 Additional accomplishments

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

### 2.1.9 Further information

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

## 2.2 Contact

If you have any questions about modules or exams, please contact the examination office of the KIT Department of Economics and Management:

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### 3 The Bachelor's degree program in Economics Engineering

#### 3.1 Qualification objectives of the Bachelor's degree in Economics Engineering

Graduates of the Bachelor's degree in Economics Engineering are equipped with strategically oriented knowledge in economics, science, law, mathematics and information technology acquired during the three-semester core program.

The economics section includes economic-related topics from microeconomics, macroeconomics and econometrics as well as finance, business management, information industry, production management, marketing and accounting.

The math section is divided into mathematics, statistics and operations research. It includes analysis and linear algebra, descriptive and inductive statistics, elementary probability theory and optimization methods.

In the engineering field, the focus is either on the physical or chemical field.

Under law, the topics of private law and public law are covered.

The technological area is covered by the Applied and Theoretical Informatics.

Through the comprehensive methodological basis, the graduates are in a position to acknowledge and apply specialized basic concepts, methods, models and approaches. They are also able to analyze and review economic, legal and technological structures as well as situations and processes.

They can apply the relevant mathematical and scientific concepts and methods as well as legal knowledge to solve concrete tasks.

The graduates have deeper knowledge in economics, business administration and selectively in statistics, informatics, operations research, law, sociology and engineering.

They are able to react based on this knowledge from the different subjects and disciplines. They thereby largely operate independently and can review, analyze, interpret and evaluate economic, legal, scientific and technical topics systematically. They can model and classify specialized problems and then come up with appropriate methods and procedures for solving the given tasks and derive improvement potentials.

The know how to validate, illustrate and interpret the obtained results.

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

Graduates of the Bachelor's degree in Economics Engineering can assume responsibility in interdisciplinary teams, technically argue and defend their position before both expert representatives and laypersons.

They have the ability to apply the acquired information to career-related activities in the industry, service sector or in the public management as well as take up a Master's degree program in Economics Engineering or any other related course.

#### 3.2 Structure of the Bachelor's degree program in Economics Engineering SPO 2015

The Bachelor's degree program in Economics Engineering entails a six-semester standard study period. The basic program is structured systematically and provides one with the fundamental knowledge in Economics Engineering. From the fourth semester, a more advanced, specialization program that can be structured depending on one's personal interests and goals is offered.

Figure 2 shows the course and module structure with the respective credit points as well as an example of a possible distribution of modules and courses in the basic program over the semesters which has proven to be useful.

Term	Credits	Business Administration	Economics	Informatics	Operations Research	Law	Physics ODER Chemistry	Statistics	Mathematics	Electives	Internship Bachelor Thesis
1 (WT)	32	BUS FA 4 CP BUS SMIEM 3 CP	ECON 1 5 CP	PROG 1 5 CP		Civil Law 5 CP Public Law 1 3 CP			MATH 1 7 CP		
2 (ST)	33	BUS PEM 4 CP	ECON 2 5 CP	INFO 1 5 CP	OR1 4,5 CP	Public Law 2 3 CP		STAT 1 5 CP	MATH 2 7 CP		
3 (WT)	33	ACC 4 CP		INFO 2 5 CP	OR2 4,5 CP		Physics 1 7 CP	Gen./Inorg. Chemistry 7 CP	STAT 2 5 CP	MATH 3 7 CP	
4 (ST)	29,5		ECON 3 5 CP				Physics 2 7 CP	Gen./Inorg. Prac. 7 CP		Seminar Module 3 CP	Internship 10 CP
5 (WT)	27	BUS 9 CP	ECON 9 CP	ECON 9 CP						Elect. Module 9 CP	Elect. Module 9 CP
6 (ST)	25,5										Bachelor Thesis 12 CP
	180										

Figure 2: Structure of the Bachelor's degree program in Engineering Economics SPO2015 (recommended)

In the **basic program** (blue), the shown modules under business administration, economics, informatics, law, physics/chemistry, mathematics and statistics are compulsory. One can choose between physics and chemistry.

In the **specialization program** (green), two modules from economics and one module from business administration must be selected. As part of the mandatory courses, one seminar module (independent of the course) and two optional modules must be completed. The two modules can be selected from informatics, operations research, business administration, economics, engineering, science, operations research, engineering, statistics, law or sociology. Basically, both optional modules can also be integrated in one course. Only one module should be omitted from law and sociology.

The **internship** can be completed before or during the Bachelor's program. The performance record of the completed internship is required for registration for the last module examination in the course.

One is free to structure his/her individual course plan as he/she wishes (taking into account the respective provisions of the study and examination regulations as well as applicable module regulations) and choose the semester he/she wishes to start and/or complete the selected modules. It is however strongly recommended to adhere to the proposal for the basic program. The content of the courses is interdisciplinary and coordinated accordingly; the intersection freedom of lectures and examination dates is guaranteed for the recommended study semester.

All modules of the basic and advanced program, including the various alternatives within the module, can be found in this module handbook. Seminars that can be taken up as part of the seminar module are published at the WiWi portal at <https://portal.wiwi.kit.edu/Seminare>.

### 3.3 Key Skills

The Bachelor's degree course in Economics Engineering at the Department of Economics and Management distinguishes itself by an exceptionally high level of interdisciplinarity. With the combination of business science, economics, informatics, operations research, mathematics as well as engineering and natural science, the integration of knowledge of different disciplines is an inherent element of the programme. As a result, interdisciplinary and connected thinking is encouraged in a natural way. The integrative taught key skills, which are acquired throughout the entire programme, can be classified into the following fields:

#### Soft skills

- Team work, social communication and creativity techniques
- Presentations and presentation techniques
- Logical and systematical arguing and writing
- Structured problem solving and communication

#### Enabling skills

- Decision making in business context
- Project management competences
- Fundamentals of business science
- English as a foreign language

#### Oriental knowledge

- Acquisition of interdisciplinary knowledge
- Institutional knowledge about economic and legal systems
- Knowledge about international organisations
- Media, technology and innovation

The integrative acquisition of key skills especially takes place in several compulsory courses during the bachelor programme, namely

- Basic programme in economics and business science
- Seminar module
- Mentoring of the bachelor thesis
- Internship
- Business science, economics and informatics modules

## 4 Field of study structure

Mandatory		
Preliminary Exam		
Bachelor Thesis		12 CR
Internship		10 CR
Business Administration		24 CR
Economics		33 CR
Informatics		15 CR
Operations Research		9 CR
Law		11 CR
Physics or Chemistry		14 CR
Statistics		10 CR
Mathematics		21 CR
Compulsory Elective Modules		21 CR

### 4.1 Preliminary Exam

Mandatory		
M-WIWI-101726	Preliminary Exam	0 CR

### 4.2 Bachelor Thesis

**Credits**  
12

Mandatory		
M-WIWI-101612	Module Bachelor Thesis	12 CR

### 4.3 Internship

**Credits**  
10

Mandatory		
M-WIWI-101610	Internship	10 CR

## 4.4 Business Administration

Credits  
24

Mandatory		
M-WIWI-101494	Fundamentals of Business Administration 1	7 CR
M-WIWI-101578	Fundamentals of Business Administration 2	8 CR
Election block: Specialisation Program Business Administration (1 item)		
M-WIWI-101467	Design, Construction and Sustainability Assessment of Buildings	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-105035	Empirical Finance	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-104911	Information Systems & Digital Business: Interaction	9 CR
M-WIWI-104912	Information Systems & Digital Business: Platforms	9 CR
M-WIWI-104913	Information Systems & Digital Business: Servitization	9 CR
M-WIWI-101513	Human Resources and Organizations	9 CR
M-WIWI-101466	Real Estate Management	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR

## 4.5 Economics

Credits  
33

Mandatory		
M-WIWI-105204	Economics	10 CR
M-WIWI-105203	Introduction in Econometrics	5 CR
Election block: Specialisation Program Economics (at least 18 credits)		
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101420	Econometrics and Economics	9 CR
M-WIWI-101608	Statistics and Econometrics	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR

## 4.6 Informatics

Credits  
15

Mandatory		
M-WIWI-101417	Foundations of Informatics	10 CR
M-WIWI-101581	Introduction to Programming	5 CR

**4.7 Operations Research****Credits**  
9

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

**4.8 Law****Credits**  
11

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

**4.9 Physics or Chemistry****Credits**  
14

Election block: Physics or Chemistry (14 credits)		
M-CHEMBIO-102335	General and Inorganic Chemistry	7 CR
M-CHEMBIO-104026	Laboratory Work in Inorganic Chemistry	7 CR
M-PHYS-100283	Experimental Physics	14 CR

**4.10 Statistics****Credits**  
10

Mandatory		
M-WIWI-101432	Introduction to Statistics	10 CR

**4.11 Mathematics****Credits**  
21

Mandatory		
M-MATH-101676	Mathematics 1	7 CR
M-MATH-101677	Mathematics 2	7 CR
M-MATH-101679	Mathematics 3	7 CR

## 4.12 Compulsory Elective Modules

Credits  
21

### Election notes

The **seminar module** (independent of subject) and **two elective modules** are to be taken within the scope of the compulsory elective course. Both modules can be chosen from the following subjects: Informatics, Operations Research, Business Administration, Economics, Engineering, Natural Sciences, Statistics, Law or Sociology. In principle, both elective modules can also be completed in one subject. However, the subjects Law and Sociology may only have one module in total.

Mandatory		
M-WIWI-101816	Seminar Module	3 CR
<b>Election block: Economics (at most 18 credits)</b>		
M-WIWI-101499	Applied Microeconomics	9 CR
M-WIWI-101403	Public Finance	9 CR
M-WIWI-101420	Econometrics and Economics	9 CR
M-WIWI-101608	Statistics and Econometrics	9 CR
M-WIWI-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR
<b>Election block: Business Administration (at most 18 credits)</b>		
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-105035	Empirical Finance	9 CR
M-WIWI-101464	Energy Economics	9 CR
M-WIWI-101435	Essentials of Finance	9 CR
M-WIWI-102752	Fundamentals of Digital Service Systems	9 CR
M-WIWI-101424	Foundations of Marketing	9 CR
M-WIWI-101437	Industrial Production I	9 CR
M-WIWI-104911	Information Systems & Digital Business: Interaction	9 CR
M-WIWI-104912	Information Systems & Digital Business: Platforms	9 CR
M-WIWI-104913	Information Systems & Digital Business: Servitization	9 CR
M-WIWI-101513	Human Resources and Organizations	9 CR
M-WIWI-101466	Real Estate Management	9 CR
M-WIWI-101425	Strategy and Organization	9 CR
M-WIWI-101421	Supply Chain Management	9 CR
M-WIWI-101465	Topics in Finance I	9 CR
M-WIWI-101423	Topics in Finance II	9 CR
<b>Election block: Informatics (at most 18 credits)</b>		
M-WIWI-101426	Electives in Informatics	9 CR
M-WIWI-105112	Applied Informatics	9 CR
<b>Election block: Operations Research (at most 18 credits)</b>		
M-WIWI-101413	Applications of Operations Research	9 CR
M-WIWI-101414	Methodical Foundations of OR	9 CR
M-WIWI-103278	Optimization under Uncertainty	9 CR
<b>Election block: Engineering Sciences (at most 18 credits)</b>		
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-WIWI-104838	Introduction to Natural Hazards and Risk Analysis	9 CR
M-ETIT-102379	Power Network	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-BGU-101004	Fundamentals of Construction	9 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-MACH-105298	Logistics and Supply Chain Management <small>neu</small>	9 CR



M-MACH-101299	Mechanical Design	8 CR
M-MACH-101277	Material Flow in Logistic Systems	9 CR
M-MACH-101287	Microsystem Technology	9 CR
M-BGU-101067	Mobility and Infrastructure	9 CR
M-MACH-101270	Product Lifecycle Management	9 CR
M-MACH-101279	Technical Logistics	9 CR
M-MACH-101275	Combustion Engines I	9 CR
M-MACH-101303	Combustion Engines II	9 CR
M-MACH-101284	Specialization in Production Engineering	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR
<b>Election block: Statistics (at most 9 credits)</b>		
M-WIWI-101608	Statistics and Econometrics	9 CR
<b>Election block: Law or Sociology (at most 9 credits)</b>		
M-INFO-101217	Public Business Law	9 CR
M-INFO-101215	Intellectual Property Law	9 CR
M-INFO-101216	Private Business Law	9 CR
M-GEISTSOZ-101167	Sociology/Empirical Social Research	9 CR
M-INFO-101191	Commercial Law	9 CR

## 5 Modules

### M

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

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(Operations Research\)](#)

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

Election block: Compulsory Elective Courses (between 1 and 2 items)			
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
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102726	<a href="#">Global Optimization I</a>	4,5 CR	Stein
T-WIWI-106199	<a href="#">Modeling and OR-Software: Introduction</a>	4,5 CR	Nickel
T-WIWI-106545	<a href="#">Optimization under Uncertainty</a>	4,5 CR	Rebennack

### Competence Certificate

Due to a research semester of Professor Nickel in WS 19/20, the events 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.ior.kit.edu/Lehrveranstaltungen.php> for further details.

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

### Prerequisites

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

**Content**

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

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

Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in 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**

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

**Annotation**

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

**Workload**

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

## M

## 5.2 Module: Applied Informatics [M-WIWI-105112]

**Responsible:** Prof. Dr. Andreas Oberweis  
 Prof. Dr. Ali Sunyaev  
 Prof. Dr. York Sure-Vetter  
 Prof. Dr. Melanie Volkamer

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

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

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	3	1

Election block: Advanced Programming (1 item)			
T-WIWI-102747	<a href="#">Advanced Programming - Java Network Programming</a>	4,5 CR	Ratz, Zöllner
T-WIWI-102748	<a href="#">Advanced Programming - Application of Business Software</a>	4,5 CR	Klink, Oberweis
Election block: Compulsory Elective Area (1 item)			
T-WIWI-110340	<a href="#">Applied Informatics – Applications of Artificial Intelligence</a>	4,5 CR	Sure-Vetter
T-WIWI-110341	<a href="#">Applied Informatics – Database Systems</a>	4,5 CR	Oberweis
T-WIWI-110342	<a href="#">Applied Informatics – Information Security</a>	4,5 CR	Volkamer
T-WIWI-110339	<a href="#">Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</a>	4,5 CR	Sunyaev
T-WIWI-110338	<a href="#">Applied Informatics – Modelling</a>	4,5 CR	Oberweis, Sure-Vetter
T-WIWI-110343	<a href="#">Applied Informatics – Software Engineering</a>	4,5 CR	Oberweis

### Competence Certificate

The assessment is carried out as two partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

- Partial exam I: *Advanced Programming - Java Network Programming* or alternatively *Advanced Programming - Application of Business Software*
- Partial exam II: all the rest

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

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

The student

- has the capability of dealing with the practical application of the Java programming language (which is the dominating programming language in many application areas) or alternatively the ability to configure, parameterize and deploy enterprise software to enable, support and automate business processes,
- knows in depth methods and systems of a core area or a core application area of Informatics according to the contents dealt with in the lectures,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

### Content

In this module, object-oriented programming skills using the Java programming language are further deepened. Alternatively important fundamentals of business information systems are conveyed that enable, support and accelerate new forms of business processes and organizational forms. Based on a core application area, basic methods and techniques of computer science are presented.

### Workload

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

## M

## 5.3 Module: Applied Microeconomics [M-WIWI-101499]

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

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
3

Election block: Compulsory Elective Courses (at least 9 credits)			
T-WIWI-102876	<a href="#">Auction &amp; Mechanism Design</a>	4,5 CR	Szech
T-WIWI-102892	<a href="#">Economics and Behavior</a>	4,5 CR	Szech
T-WIWI-102850	<a href="#">Introduction to Game Theory</a>	4,5 CR	Puppe, Reiß
T-WIWI-102792	<a href="#">Decision Theory</a>	4,5 CR	Ehrhart
T-WIWI-102844	<a href="#">Industrial Organization</a>	4,5 CR	Reiß
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger
T-WIWI-102736	<a href="#">Economics III: Introduction in Econometrics</a>	5 CR	Schienze
T-WIWI-100005	<a href="#">Competition in Networks</a>	4,5 CR	Mitusch

### Competence Certificate

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

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

### Competence Goal

Students

- are introduced to the basic theoretical analysis of strategic interaction situations and shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings, (course "Introduction to Game Theory");
- are exposed to the basic problems of imperfect competition and its implications for policy making; (course "Industrial Organization");
- are provided with the basic economics of network industries (e.g., telecom, utilities, IT, and transport sectors) and should get a vivid idea of the special characteristics of network industries concerning planning, competition, competitive distortion, and state intervention, (course "Competition in Networks").

### Prerequisites

None.

### Content

The module's purpose is to extend and foster skills in microeconomic theory by investigating a variety of applications. Students shall be able to analyze real-life problems using microeconomics.

### Recommendation

Completion of the module Economics is assumed.

### Workload

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

## M

## 5.4 Module: Combustion Engines I [M-MACH-101275]

**Responsible:** Prof. Dr. Thomas Koch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each winter term	<b>Duration</b> 1 semester	<b>Level</b> 4	<b>Version</b> 4
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Election block: Wahlpflicht (between 1 and 2 items)			
T-MACH-102194	<a href="#">Combustion Engines I</a>	5 CR	Koch, Kubach
T-MACH-105564	<a href="#">Energy Conversion and Increased Efficiency in Internal Combustion Engines</a>	4 CR	Koch, Kubach

### Competence Certificate

The module examination contains of two oral examinations. The module score results from the two scores weighted according to the ECTS.

### Competence Goal

The student can name and explain the working princile of combustion engines. He is able to analyse and evaluate the combustion process. He is able to evaluate influences of gas exchange, mixture formation, fuels and exhaust gas aftertreatment on the combustion performance. He can solve basic research problems in the field of engine development.

The student can name all important influences on the combustion process. He can analyse and evaluate the engine process considering efficiency, emissions and potential.

### Prerequisites

None

### Content

Working Principle og ICE  
 Characteristic Parameters  
 Characteristic parameters  
 Engine parts  
 Crank drive  
 Fuels  
 Gasolien engine operation modes  
 Diesel engine operation modes  
 Emissions  
 Fundamentals of ICE combustion  
 Thermodynamics of ICE  
 Flow field  
 Wall heat losses  
 Combsution in Gasoline and Diesel engines  
 Heat release calculation  
 Waste heat recovery

### Workload

regular attendance: 62 hours  
 self-study: 208 hours

## M

## 5.5 Module: Combustion Engines II [M-MACH-101303]

**Responsible:** Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Compulsory Elective Modules (Engineering Sciences)

Credits	Recurrence	Level	Version
9	Each term	4	2

Mandatory			
T-MACH-104609	Combustion Engines II	5 CR	Koch, Kubach
Election block: Verbrennungsmotoren II (at least 4 credits)			
T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment	4 CR	Deutschmann, Grunwaldt, Kubach, Lox
T-MACH-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines	4 CR	Gohl
T-MACH-105184	Fuels and Lubricants for Combustion Engines	4 CR	Kehrwald, Kubach
T-MACH-105167	Analysis Tools for Combustion Diagnostics	4 CR	Pfeil
T-MACH-102197	Gas Engines	4 CR	Golloch, Kubach
T-MACH-102199	Model Based Application Methods	4 CR	Kirschbaum
T-MACH-105169	Engine Measurement Techniques	4 CR	Bernhardt

### Competence Certificate

The assessment consists of an oral exam (60 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

### Competence Goal

See courses.

### Prerequisites

None

### Content

#### Compulsory:

Supercharging and air management

Engine maps Emissions and Exhaust gas aftertreatment

Transient engine operation ECU application

Electrification and alternative powertrains

#### Elective:

Fuels and lubricants for ICE

Fundamentals of catalytic EGA

Analysis tools for combustion diagnostics

Engine measurement techniques

Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines

### Workload

regular attendance: 62 h

self-study: 208 h

## M

## 5.6 Module: Commercial Law [M-INFO-101191]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	3	3

Mandatory			
T-INFO-102013	<a href="#">Exercises in Civil Law</a>	9 CR	Dreier, Matz



## M

## 5.7 Module: Constitutional and Administrative Law [M-INFO-101192]

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

Credits	Recurrence	Duration	Language	Level	Version
6	Each term	2 semester	German	3	4

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

**Workload**

See German version.

## M

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

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	3	3

Mandatory			
T-WIWI-102742	<a href="#">Design, Construction and Sustainability Assessment of Buildings I</a>	4,5 CR	Lützkendorf
T-WIWI-102743	<a href="#">Design, Construction and Sustainability Assessment of Buildings II</a>	4,5 CR	Lützkendorf

**Competence Certificate**

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

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

**Competence Goal**

The student

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

**Prerequisites**

None

**Content**

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

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

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

**Recommendation**

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

Furthermore a combination with courses in the area of

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

is recommended.

**Workload**

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

## M

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

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Business Administration (Specialisation Program Business Administration)  
 Compulsory Elective Modules (Business Administration)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
9

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-109936	Platform Economy	4,5 CR	Dorner, Weinhardt
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt

### Competence Certificate

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

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

### Competence Goal

The students

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

### Prerequisites

None

### Content

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

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

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

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

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

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

## M

## 5.10 Module: Econometrics and Economics [M-WIWI-101420]

**Responsible:** apl. Prof. Dr. Wolf-Dieter Heller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Level</b> 3	<b>Version</b> 3
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Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-103063	<a href="#">Analysis of Multivariate Data</a>	4,5 CR	Grothe
T-WIWI-102792	<a href="#">Decision Theory</a>	4,5 CR	Ehrhart
T-WIWI-103065	<a href="#">Statistical Modeling of Generalized Regression Models</a>	4,5 CR	Heller
T-WIWI-102844	<a href="#">Industrial Organization</a>	4,5 CR	Reiß

**Competence Certificate**

See German version.

**Competence Goal**

See German version.

**Prerequisites**

For further information see German version.

**Recommendation**

None

**Annotation**

T-WIWI-102844 "Industrial Organization" replaces T-WIWI-102824 "Theory of Business Cycles" starting summer term 2016.

**Workload**

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

## M

## 5.11 Module: Economic Policy I [M-WIWI-101668]

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
9

Mandatory			
T-WIWI-103213	<a href="#">Basic Principles of Economic Policy</a>	4,5 CR	Ott
Election block: Compulsory Elective Courses (1 item)			
T-WIWI-109121	<a href="#">Macroeconomic Theory</a>	4,5 CR	Brumm
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger
T-WIWI-102908	<a href="#">Personnel Policies and Labor Market Institutions</a>	4,5 CR	Nieken
T-WIWI-100005	<a href="#">Competition in Networks</a>	4,5 CR	Mitusch

### Competence Certificate

The module examination takes place in the form of examinations (§4(2),1 SPO) of the selected partial module performance. The examination is carried out separately for each partial module and is described there. It is possible to repeat examinations at any regular examination date.

The grades of the partial module correspond to the grades of the passed examinations. The overall grade of the module is formed from the grades of the partial performances weighted with LP.

### Competence Goal

Students shall be given the ability to

- understand and deepen basic concepts of micro- and macroeconomic theories
- apply those theories to economic policy issues
- understand government interventions in the market and their legitimation from the perspective of economic welfare
- learn how theory-based policy recommendations are derived

### Prerequisites

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

### Content

- Intervention in the market: micro-economic perspective
- Intervention in the market: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Carriers of economic policy: political-economic aspects

### Recommendation

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

### Workload

Total effort for 9 credit points: approx. 270 hours. The distribution is made according to the credit points of the courses of the module.

## M

## 5.12 Module: Economic Theory [M-WIWI-101501]

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German/English	3	3

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102609	<a href="#">Advanced Topics in Economic Theory</a>	4,5 CR	Mitusch
T-WIWI-102876	<a href="#">Auction &amp; Mechanism Design</a>	4,5 CR	Szech
T-WIWI-102892	<a href="#">Economics and Behavior</a>	4,5 CR	Szech
T-WIWI-102850	<a href="#">Introduction to Game Theory</a>	4,5 CR	Puppe, Reiß
T-WIWI-102844	<a href="#">Industrial Organization</a>	4,5 CR	Reiß
T-WIWI-109121	<a href="#">Macroeconomic Theory</a>	4,5 CR	Brumm
T-WIWI-102610	<a href="#">Welfare Economics</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 module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Competence Goal**

See German version.

**Prerequisites**

None

**Content**

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

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

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

**Recommendation**

None

**Annotation**

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

## M

## 5.13 Module: Economics [M-WIWI-105204]

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

Credits	Recurrence	Language	Level	Version
10	Each term	German	3	1

Mandatory			
T-WIWI-102708	<a href="#">Economics I: Microeconomics</a>	5 CR	Puppe, Reiß
T-WIWI-102709	<a href="#">Economics II: Macroeconomics</a>	5 CR	Wigger

**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 of the course.

**Competence Goal**

The student

- knows and understands the basics of economic problems
- understands current economic policy problems which occur in a globalized world
- is able to find a solution strategies using an economical approach

**Prerequisites**

None

**Content**

Essential concepts, methods and models of the micro and macroeconomic theory are discussed.

The lecture Economics I [2610012] discusses basics of game theory in addition to microeconomic decision theory, questions of market theory and problems of imperfect competition. Economics II [2600014] handles the economical organizational model, national accounts as well as international trade and monetary policy. Furthermore, complex growth, boom and economic speculations are discussed.

**Recommendation**

It is recommended to attend the lectures in the following order: Economics I: Microeconomics [2610012], Economics II: Macroeconomics [2600014], Economics III: Introduction in Econometrics [2520016].

**Annotation**

**Notice:** The lecture *Economics I: Microeconomics* [2610012] is part of the preliminary examination concerning § 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

**Workload**

The total workload for this module is approximately 300 hours.



## M

## 5.14 Module: eFinance [M-WIWI-101402]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Business Administration (Specialisation Program Business Administration)  
 Compulsory Elective Modules (Business Administration)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German/English	3	8

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

### Competence Certificate

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

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

### Competence Goal

The students

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

### Prerequisites

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

### Content

The module "eFinance: Information engineering and management in finance" addresses current problems in the finance sector. It is investigated the role of information and knowledge in the finance sector and how information systems can solve or extenuate them. Speakers from practice will contribute to lectures with their broad knowledge. Core courses of the module deal with the background of banks and insurance companies and the electronic commerce of stocks in global finance markets. In addition the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a supplementary understanding for capital markets.

Information management topics are in the focus of the lecture "eFinance: information engineering and management for securities trading". For the functioning of the international finance markets, it is necessary that there is an efficient information flow. Also, the regulatory frameworks play an important role. In this context, the role and the functioning of (electronic) stock markets, online brokers and other finance intermediaries and their platforms are presented. Not only IT concepts of German finance intermediaries are presented, but also international system approaches will be compared. The lecture is supplemented by speakers from the practice (and excursions, if possible) coming from the Deutsche Börse and the Stuttgart Stock Exchange.

### Annotation

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the <http://www.iism.kit.edu/im/lehre>

### Workload

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

## M

## 5.15 Module: Electives in Informatics [M-WIWI-101426]

**Responsible:** Prof. Dr. Andreas Oberweis  
 Prof. Dr. Ali Sunyaev  
 Prof. Dr. York Sure-Vetter  
 Prof. Dr. Melanie Volkamer

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

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

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	3	11

Election block: Compulsory Elective Area (between 1 and 2 items)			
T-WIWI-110340	Applied Informatics – Applications of Artificial Intelligence	4,5 CR	Sure-Vetter
T-WIWI-110341	Applied Informatics – Database Systems	4,5 CR	Oberweis
T-WIWI-110342	Applied Informatics – Information Security	4,5 CR	Volkamer
T-WIWI-110339	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	4,5 CR	Sunyaev
T-WIWI-110338	Applied Informatics – Modelling	4,5 CR	Oberweis, Sure-Vetter
T-WIWI-110343	Applied Informatics – Software Engineering	4,5 CR	Oberweis
T-WIWI-110711	Supplement Applied Informatics	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-104679	Foundations of Mobile Business	4,5 CR	Oberweis
Election block: Advanced Labs (at most 1 item)			
T-WIWI-110541	Advanced Lab Informatics (Master)	4,5 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-108439	Advanced Lab Security, Usability and Society	4,5 CR	Volkamer
T-WIWI-109786	Advanced Lab Security	4,5 CR	Volkamer

**Competence Certificate**

The assessment is carried out as two 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.

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.

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**

The student

- knows and has mastered methods and systems for core topics and core application areas of computer science,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

**Prerequisites**

None

**Content**

The elective module conveys advanced knowledge in the area of applied computer science. This includes, for example, the efficient design and optimization of technical systems, the design and management of database applications or the systematic development of large software systems. Moreover, modeling of complex systems, the use of computer science methods to support knowledge management, and the design and implementation of service-oriented architectures are discussed in this module.

**Workload**

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

## M

## 5.16 Module: Empirical Finance [M-WIWI-105035]

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Business Administration (Specialisation Program Business Administration)  
 Compulsory Elective Modules (Business Administration)

Credits	Recurrence	Language	Level	Version
9	Each winter term	English	3	2

Mandatory			
T-WIWI-110216	Empirical Finance	6 CR	Ulrich
T-WIWI-110217	Python for Empirical Finance	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 "Empirical Finance" is carried out in form of a written exam (90 minutes), the assessment of "Python for Empirical Finance" is carried out in form of six biweekly 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 the fundamental concepts of modern portfolio theory and their realization in Python. The course focuses on the implementation of statistical concepts in Python, such that students are able to make investment decision under uncertainty after successful completion of this module.

**Content**

The module covers several topics, among them:

- Mean-Variance Portfolio Optimization
- Modeling Distribution of Asset Returns with Factor Models and ARMA-GARCH
- Monte-Carlo Simulation
- Parameter Estimation with Maximum Likelihood and Regressions?

**Recommendation**

Prior knowledge of statistics 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

## 5.17 Module: Energy Economics [M-WIWI-101464]

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

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

Mandatory			
T-WIWI-102746	<a href="#">Introduction to Energy Economics</a>	5,5 CR	Fichtner
Election block: Supplementary Courses (3,5 credits)			
T-WIWI-102607	<a href="#">Energy Policy</a>	3,5 CR	Wietschel
T-WIWI-100806	<a href="#">Renewable Energy-Resources, Technologies and Economics</a>	3,5 CR	Jochem, McKenna

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction into Energy Economics* [2581010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 able to understand interdependencies in energy economics and to evaluate ecological impacts in energy supply,
- is able to assess the different energy carriers and their characteristics,
- knows the energy political framework conditions,
- gains knowledge about new market-based conditions and the cost and potentials of renewable energies in particular.

**Prerequisites**

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

**Content**

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

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

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

**Recommendation**

The courses are conceived in a way that they can be attended independently from each other. Therefore, it is possible to start the module in winter and summer term.

**Annotation**

Additional study courses (E.g. from other universities) can be transferred to the grade of the module on special request at the institute.

**Workload**

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

## M

## 5.18 Module: Essentials of Finance [M-WIWI-101435]

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

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

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	1 semester	German	3	2

Mandatory			
T-WIWI-102605	<a href="#">Financial Management</a>	4,5 CR	Ruckes
T-WIWI-102604	<a href="#">Investments</a>	4,5 CR	Uhrig-Homburg

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 fundamental skills in modern finance
- has fundamental skills to support investment decisions on stock, bond and derivative markets
- applies concrete models to assess investment decisions on financial markets as well as corporate investment and financing decisions.

**Prerequisites**

None

**Content**

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

**Workload**

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

## M

## 5.19 Module: Experimental Physics [M-PHYS-100283]

**Responsible:** Prof. Dr. Thomas Schimmel  
**Organisation:** KIT Department of Physics  
**Part of:** [Physics or Chemistry](#)

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

Mandatory			
T-PHYS-100278	<a href="#">Experimental Physics</a>	14 CR	Schimmel

**Competence Certificate**

The grade of the module is determined by a written exam.

**Prerequisites**

none

**Workload**

Total workload with 14 credit points: approx. 420 hours.

## M

## 5.20 Module: Extracurricular Module in Engineering [M-WIWI-101404]

**Responsible:** Prüfungsausschuss der KIT-Fakultät für Wirtschaftswissenschaften  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Level	Version
9	Once	3	5

Election block: Compulsory Elective Courses (between 9 and 12 credits)			
T-WIWI-106291	<a href="#">PH APL-ING-TL01</a>	3 CR	
T-WIWI-106292	<a href="#">PH APL-ING-TL02</a>	3 CR	
T-WIWI-106293	<a href="#">PH APL-ING-TL03</a>	3 CR	
T-WIWI-106294	<a href="#">PH APL-ING-TL04 ub</a>	0 CR	
T-WIWI-106295	<a href="#">PH APL-ING-TL05 ub</a>	0 CR	
T-WIWI-106296	<a href="#">PH APL-ING-TL06 ub</a>	0 CR	
T-WIWI-108384	<a href="#">PH APL-ING-TL07</a>	3 CR	

**Competence Certificate**

The assessment of the module is determined by the respective module coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points (max. 12 credits) and at least 6 hours per week (max. 8 hours per week). The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

The formation of the overall grade of the module will be determined by the respective module coordinator.

**Competence Goal**

See German version.

**Prerequisites**

The intended composition of courses, the module designation and the details of the examination for an Extracurricular Module in Engineering must be confirmed by a module coordinator (professor) of the responsible engineering department. The module coordinator makes sure that the individual courses of the module complement each other in a meaningful way and that no random sequence of various individual examinations is combined.

The responsible module coordinator certifies that the examination can be taken as described and that the details of the courses in the application are correct.

The informal application (not handwritten!) will then be submitted to the Examination Office of the KIT Department of Economics and Management.

The examination board of the KIT Department of Economics and Management decides on the basis of the rules and regulations that have been adopted, in particular with regard to the content (see also [https://www.wiwi.kit.edu/Genehmigung\\_Ingenieurmodul.php\\_Ingenieurmodul.php](https://www.wiwi.kit.edu/Genehmigung_Ingenieurmodul.php_Ingenieurmodul.php)) as well as the application form completed by the student and signed by the respective module coordinator.

A maximum of one Extracurricular Module in Engineering can be taken.

**Workload**

The total workload for this module is about 270 hours (9 credits). The distribution is based on the credit points of the courses completed as part of the module.



## M

**5.21 Module: Foundations of Informatics [M-WIWI-101417]**

**Responsible:** Dr. rer. nat. Pradyumn Kumar Shukla  
Prof. Dr. York Sure-Vetter

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

**Part of:** Informatics

Credits	Recurrence	Duration	Level	Version
10	Each term	2 semester	3	1

Mandatory			
T-WIWI-102749	Foundations of Informatics I	5 CR	Sure-Vetter
T-WIWI-102707	Foundations of Informatics II	5 CR	Rettinger

**Competence Certificate**

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

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. For a successful module assessment both partial exams have to be passed.

- Foundations of Informatics I: Written exam in the first week of the recess period (60 min)
- Foundations of Informatics II: Written exam in the first week of the recess period (90 min). It is possible to gain 0,3-0,4 additional grading points for a passed exam by successful completion of a bonus exam.

When both partial exams are passed, the overall grade of the module is the average of the grades for each course weighted by the credit points and truncated after the first decimal.

**Competence Goal**

The student

- knows the main principles, methods and systems of computer science,
- can use this knowledge for applications in advanced computer science courses and other areas for situation-adequate problem solving,
- is capable of finding strategic and creative responses in the search for solutions to well defined, concrete, and abstract problems.

The student can deepen the learned concepts, methods, and systems of computer science in advanced computer science lectures.

**Prerequisites**

None

**Content**

This module conveys knowledge about modeling, logic, algorithms, sorting and searching algorithms, complexity theory, problem specifications, and data structures. From the field of theoretical computer science, formal models of automata, languages and algorithms are presented and applied to the architecture of computer systems.

**Recommendation**

It is strongly recommended to attend the courses of the core program in the following sequence: *Introduction to Programming with Java, Foundations of Informatics I, Foundations of Informatics II*

**Workload**

The total workload for this module is approximately 300 hours.

## M

## 5.22 Module: Foundations of Marketing [M-WIWI-101424]

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	3	5

Mandatory			
T-WIWI-102805	<a href="#">Managing the Marketing Mix</a>	4,5 CR	Klarmann
Election block: Supplementary Courses (at least 4,5 credits)			
T-WIWI-102806	<a href="#">Services Marketing and B2B Marketing</a>	3 CR	Klarmann
T-WIWI-102807	<a href="#">International Marketing</a>	1,5 CR	Feurer

**Competence Certificate**

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

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

**Prerequisites**

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

**Content**

The core course of the module is "Marketing Mix". This course is compulsory and must be examined. "Marketing Mix" contains instruments and methods that enable you to goal-oriented decisions in the operative marketing management (product management, pricing, promotion and sales management).

To deepen the marketing knowledge students can complete the courses "Services- and B2B-Marketing" and "International Marketing".

**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 module is approximately 270 hours. For further information see German version.

## M

## 5.23 Module: Fundamentals of Business Administration 1 [M-WIWI-101494]

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

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

**Part of:** [Business Administration \(mandatory\)](#)

Credits	Recurrence	Duration	Level	Version
7	Each term	3 semester	3	1

Mandatory			
T-WIWI-102817	<a href="#">Business Administration: Strategic Management and Information Engineering and Management</a>	3 CR	Nieken, Ruckes
T-WIWI-102819	<a href="#">Business Administration: Finance and Accounting</a>	4 CR	Ruckes, Uhrig-Homburg, Wouters

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the individual courses of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedure of each course of this module is defined for each course 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 business administration in particular with respect to decision making and the model based view of business corporations
- masters the fundamentals of business and information management as well as the fundamentals business finance and the principles of business accounting
- is able to analyze and assess central tasks, functions and decisions in modern corporations

The knowledge of the two fundamentals modules in business administration forms the basis for the successful completion of advanced courses in the field of business administration and management.

**Prerequisites**

None

**Content**

This module provides the fundamentals of business administration and management. Further, the module focuses on the fields of management and organization, information engineering and management, investment and financing as well as of the principles of management and financial accounting.

**Recommendation**

It is strongly recommended to take the courses in the first semester of study.

**Workload**

The total workload of the module is about 210 hours. The workload is proportional to the credit points of the individual courses.

## M

## 5.24 Module: Fundamentals of Business Administration 2 [M-WIWI-101578]

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

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

**Part of:** [Business Administration \(mandatory\)](#)

**Credits**  
8

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
1

Mandatory			
T-WIWI-102818	<a href="#">Business Administration: Production Economics and Marketing</a>	4 CR	Fichtner, Klarmann, Lützkendorf, Ruckes, Schultmann
T-WIWI-102816	<a href="#">Financial Accounting and Cost Accounting</a>	4 CR	Strych

### 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. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures of each course of this module is defined for each course 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 business administration in particular with respect to decision making and the model based view of business corporations
- masters the fundamentals of production and operations management and marketing as well as the fundamentals of management and financial accounting
- is able to analyze and assess central tasks, functions and decisions in modern corporations

The knowledge of the two fundamentals modules in business administration forms the basis for the successful completion of advanced courses in the field of business administration and management.

### Prerequisites

None

### Content

The basics of internal and external accounting and general business administration are taught as the theory of business in the company. Building on this, the focus will be on marketing and production management.

### Recommendation

It is strongly recommended to take the courses in the second semester (Betriebswirtschaftslehre: Produktionswirtschaft und Marketing) and third semester (Rechnungswesen) of study.

### Workload

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

## M

## 5.25 Module: Fundamentals of Construction [M-BGU-101004]

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	3	2

Mandatory			
T-BGU-101691	<a href="#">Construction Technology</a>	6 CR	Haghsheno
T-BGU-101675	<a href="#">Project Management</a>	3 CR	Haghsheno

**Competence Goal**

The student

- is familiar with all substantial domains of construction
- knows and understands substantial construction methods and construction machines
- masters basic construction calculations
- knows and understands the fundamentals of project management in civil engineering
- can apply his / her knowledge in a goal-oriented manner to accomplish a construction project efficiently

**Prerequisites**

none

**Recommendation**

None

**Annotation**

We encourage students to deepen their knowledge in construction by building additional customized modules from the courses offered by TMB. Please consult with the tutors of this module. Further information is available at [www.tmb.kit.edu](http://www.tmb.kit.edu).

## M

## 5.26 Module: Fundamentals of Digital Service Systems [M-WIWI-102752]

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

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

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	6

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-109938	<a href="#">Digital Services</a>	4,5 CR	Satzger, Weinhardt
T-WIWI-109816	<a href="#">Foundations of Interactive Systems</a>	4,5 CR	Mädche
T-WIWI-110888	<a href="#">Practical Seminar: Digital Services</a>	4,5 CR	Satzger, Weinhardt

**Competence Certificate**

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

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

**Competence Goal**

Students

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

**Prerequisites**

None

**Content**

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

**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****5.27 Module: General and Inorganic Chemistry [M-CHEMBIO-102335]****Organisation:** KIT Department of Chemistry and Biosciences**Part of:** [Physics or Chemistry](#)

<b>Credits</b> 7	<b>Language</b> German	<b>Level</b> 3	<b>Version</b> 1
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Mandatory			
T-CHEMBIO-101866	<a href="#">General and Inorganic Chemistry</a>	7 CR	Ruben

**Prerequisites**

none

## M

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

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	4

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

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 and analyzes basic concepts, instruments, and challenges of present human resource and organizational management.
- uses the techniques he / she has learned to evaluate strategic situations which occur in human resource and organizational management.
- evaluates the strengths and weaknesses of existing structures and rules based on systematic criterions.
- Discusses and evaluates the practical use of models and methods by using case studies.
- has basic knowledge of fit and challenges of different scientific methods in the context of personnel and organizational economics.

**Prerequisites**

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

**Content**

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

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

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

**Recommendation**

Completion of module Business Administration is recommended.

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

**Workload**

The total workload for this module is approximately 270 hours.



## M

## 5.29 Module: Industrial Production I [M-WIWI-101437]

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German/English	3	3

Mandatory			
T-WIWI-102606	<a href="#">Fundamentals of Production Management</a>	5,5 CR	Schultmann
Election block: Supplementary Courses (3,5 credits)			
T-WIWI-102870	<a href="#">Logistics and Supply Chain Management</a>	3,5 CR	Schultmann, Wiens
T-WIWI-102820	<a href="#">Production Economics and Sustainability</a>	3,5 CR	Schultmann, Volk

### Competence Certificate

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course "Fundamentals of Production Management" [2581950] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

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

### Competence Goal

- Students shall be aware of the important role of industrial production and logistics for production management.
- Students shall use relevant concepts of production management and logistics in an adequate manner.
- Students shall be able to reflect on decision principles in firms and their circumstances in the light of the production management aspects studied.
- Students shall be proficient in describing essential tasks, difficulties and solutions to problems in production management and logistics
- Students shall be able to describe relevant approaches of modeling production and logistic systems.
- Students shall be aware of the important role of material and energy-flows in production systems.
- Students shall be proficient in using exemplary methods for solving selected problems.

### Prerequisites

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

### Content

This module is designed to introduce students into the wide area of industrial production and logistics management. It focuses on strategic production management under the aspect of sustainability. The courses use interdisciplinary approaches of systems, also theory to describe the central tasks of industrial production management and logistics. Herein, attention is drawn upon strategic corporate planning, research and development as well as site selection. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.

### Workload

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

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

## M

## 5.30 Module: Information Systems &amp; Digital Business: Interaction [M-WIWI-104911]

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

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

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	3

Election block: Compulsory Elective Area ()			
T-WIWI-109816	<a href="#">Foundations of Interactive Systems</a>	4,5 CR	Mädche
T-WIWI-109936	<a href="#">Platform Economy</a>	4,5 CR	Dorner, Weinhardt
T-WIWI-109935	<a href="#">Practical Seminar Interaction</a>	4,5 CR	Mädche, Weinhardt
T-WIWI-106569	<a href="#">Consumer Behavior</a>	4,5 CR	Scheibehenne

**Competence Certificate**

The module examination takes place in the form of partial examinations in accordance with § 4 Para. 2 No. 1 - No. 3 SPO via courses of the module amounting to a total of at least 9 LP.

The overall score of the module is formed from the credit-weighted scores of the partial examinations and truncated after the first decimal place.

**Competence Goal**

Students

- understand the basic concepts of interactive systems as well as the economic foundations and key components of platforms
- explore the theoretical grounding of interactive systems leveraging theories from reference disciplines such as psychology
- understand business models, network effects of digital platforms and get to know different market forms and market mechanisms
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results

## Content

The “Information Systems & Digital Business” modules of the research groups of Prof. Dr. Alexander Mädche (Information Systems & Service Design), Prof. Dr. Gerhard Satzger (Digital Service Innovation) and Prof. Dr. Christof Weinhardt ([Information & Market Engineering](#)), offer a comprehensive overview on important topics of digitalization – blending aspects of digital interaction, digital services and the platform economy.

Courses in this module cover the aspects of interaction between humans and information systems as well as the economic foundations of platform businesses:

- **Foundations of Interactive Systems:** Advanced information and communication technologies (ICT) make interactive systems ever-present in the users’ private and business life. They are an integral part of E-Commerce portals or social networking sites as well as at the workplace, e.g. in the form of collaboration portals or analytical dashboards. Furthermore, with the ever-increasing capabilities of ICT, the design of human-computer interaction is becoming increasingly important. The aim of this module is to introduce the foundations, related theories, key concepts, and design principles as well as current practice of contemporary interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.
- **Platform Economy:** Apple, Alphabet, Amazon, Microsoft, und Facebook; five of the most valuable companies worldwide create large portions of their profits employing a digital platform model. This module teaches the key design considerations of digital platforms: their foundations in economic theory, their core components and design aspects, the adequate selection of market mechanisms for achieving certain goals and the role of user behavior in the context of digital platforms. The theoretic foundations are enriched by discussions of several real-world examples, e.g. from the finance sector. Thus, the students are enabled to a) analyze given platforms and make recommendations for improvements and b) independently design new platforms for given use cases.
- **Consumer Behavior:** Consumer decisions are ubiquitous in daily life and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. To help people making better choices it is important to understand the factors that influence their behavior. Towards this goal, we will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates. The lecture will be held in English.

## Workload

Total effort for 9 credit points: approx. 270 hours. The distribution is based on the credit points of the courses of the module (120-135h for courses with 4.5 credit points). The total number of hours per course results from the effort required to attend lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

## 5.31 Module: Information Systems &amp; Digital Business: Platforms [M-WIWI-104912]

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

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

**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	4

Election block: Compulsory Elective Courses ( )			
T-WIWI-109938	<a href="#">Digital Services</a>	4,5 CR	Satzger, Weinhardt
T-WIWI-110797	<a href="#">eFinance: Information Systems for Securities Trading</a>	4,5 CR	Weinhardt
T-WIWI-109936	<a href="#">Platform Economy</a>	4,5 CR	Dorner, Weinhardt
T-WIWI-109937	<a href="#">Practical Seminar Platforms</a>	4,5 CR	Satzger, Weinhardt

### Competence Certificate

The module examination takes place in the form of partial examinations in accordance with § 4 Para. 2 No. 1 - No. 3 SPO via courses of the module amounting to a total of at least 9 LP.

The overall score of the module is formed from the credit-weighted scores of the partial examinations and truncated after the first decimal place.

### Competence Goal

Students

- understand services from different perspectives, the concept of value creation in service systems as well as the economic foundations and key components or platforms
- get familiar with concepts, methods and tools for the design, modelling, development and management of digital services and platforms
- understand the categories and trends of platforms as providers of digital services
- gain experience in group work as well as in the analysis of case studies and the professional presentation of research results
- are enabled to design new platforms based on a business idea.

### Content

The "Information Systems & Digital Business" modules of the research groups of Prof. Dr. Alexander Mädche ([Information Systems & Service Design](#)), Prof. Dr. Gerhard Satzger (Digital Service Innovation) and Prof. Dr. Christof Weinhardt ([Information & Market Engineering](#)), offer a comprehensive overview on important topics of digitalization – blending aspects of digital interaction, digital services and the platform economy.

Courses in this module cover the technical and economic aspects of digital services as well as their application in the platform economy:

- **Digital Services:** The global economy is increasingly determined by services: in industrialized countries, nearly 70% of gross value added is achieved in the tertiary sector. For the design, development and the management of services traditional "goods-focused" concepts are often insufficient or inappropriate – even more so, if companies reap the ample opportunities to offer digital services. The course is centered around the concepts of joint value creation within service systems. It covers the theoretical background of services and service innovation, technical and economic aspects of cloud and cloud labor services as well as webservices. It focusses on the potential to leverage data for novel digital services and business models and to form dynamic and scalable service value networks. It comprises hands-on experience to conceive and build novel digital, cloud-based services.
- **Platform Economy:** Apple, Alphabet, Amazon, Microsoft, und Facebook; five of the most valuable companies worldwide create large portions of their profits employing a digital platform model. This module teaches the key design considerations of digital platforms: their foundations in economic theory, their core components and design aspects, the adequate selection of market mechanisms for achieving certain goals and the role of user behavior in the context of digital platforms. The theoretic foundations are enriched by discussions of several real-world examples, e.g. from the finance sector. Thus, the students are enabled to a) analyze given platforms and make recommendations for improvements and b) independently design new platforms for given use cases.

**Workload**

Total effort for 9 credit points: approx. 270 hours. The distribution is based on the credit points of the courses of the module (120-135h for courses with 4.5 credit points). The total number of hours per course results from the effort required to attend lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

**5.32 Module: Information Systems & Digital Business: Servitization [M-WIWI-104913]**

<b>Responsible:</b>	Prof. Dr. Alexander Mädche Prof. Dr. Gerhard Satzger
<b>Organisation:</b>	KIT Department of Economics and Management
<b>Part of:</b>	<a href="#">Business Administration (Specialisation Program Business Administration)</a> <a href="#">Compulsory Elective Modules (Business Administration)</a>

<b>Credits</b>	<b>Recurrence</b>	<b>Language</b>	<b>Level</b>	<b>Version</b>
9	Each term	German	3	2

Election block: Compulsory Elective Courses ()			
T-WIWI-109938	<a href="#">Digital Services</a>	4,5 CR	Satzger, Weinhardt
T-WIWI-109816	<a href="#">Foundations of Interactive Systems</a>	4,5 CR	Mädche
T-WIWI-109939	<a href="#">Practical Seminar Servitization</a>	4,5 CR	Mädche, Satzger

**Competence Certificate**

The module examination takes place in the form of partial examinations in accordance with § 4 Para. 2 No. 1 - No. 3 SPO via courses of the module amounting to a total of at least 9 LP.

The overall score of the module is formed from the credit-weighted scores of the partial examinations and truncated after the first decimal place.

**Competence Goal**

Students

- understand services from different perspectives and the concept of value creation in service systems
- get familiar with concepts, methods and tools for the design, modelling, development and management of digital services and interactive systems
- understand the basic characteristics and effects of interactive systems as an integral element of digital services – theoretically grounded in reference disciplines such as psychology
- get hands-on experience in conceptualizing and designing digital services and interactive systems in real use cases.

**Content**

The “Information Systems & Digital Business” modules of the research groups of Prof. Dr. Alexander Mädche ([Information Systems & Service Design](#)), Prof. Dr. Gerhard Satzger ([Digital Service Innovation](#)) and Prof. Dr. Christof Weinhardt ([Information & Market Engineering](#)), offer a comprehensive overview on important topics of digitalization – blending aspects of digital interaction, digital services and the platform economy.

Courses in this module cover the technical and economic aspects of digital services as well as the interaction of humans with information systems:

- **Digital Services:** The global economy is increasingly driven by services: in industrialized countries, nearly 70% of gross value added is achieved in the tertiary sector. For the design, development and the management of services traditional “goods-focused” concepts are often insufficient or inappropriate – even more so, if companies reap the ample opportunities to offer digital services. The course is centered around the concepts of joint value creation within service systems. It covers the theoretical background of services and service innovation, technical and economic aspects of cloud and cloud labor services as well as webservices. It focuses on the potential to leverage data for novel digital services and business models and to form dynamic and scalable service value networks. It comprises hands-on experience to conceive and build novel digital, cloud-based services.
- **Foundations of Interactive Systems:** Advanced information and communication technologies (ICT) make interactive systems ever-present in the users’ private and business life. They are an integral part of E-Commerce portals or social networking sites as well as at the workplace, e.g. in the form of collaboration portals or analytical dashboards. Furthermore, with the ever-increasing capabilities of ICT, the design of human-computer interaction is becoming increasingly important. The aim of this module is to introduce the foundations, related theories, key concepts, and design principles as well as current practice of contemporary interactive systems. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

**Workload**

Total effort for 9 credit points: approx. 270 hours. The distribution is based on the credit points of the courses of the module (120-135h for courses with 4.5 credit points). The total number of hours per course results from the effort required to attend lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

## M

## 5.33 Module: Integrated Production Planning [M-MACH-101272]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

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

Mandatory			
T-MACH-109054	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>	9 CR	Lanza

### Competence Certificate

Written Exam (120 min)

### Competence Goal

The students

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

### Prerequisites

none

### Content

Within this engineering sciences-oriented module the students will get to learn principle aspects of organization and planning of production systems.

### Workload

regular attendance: 63 hours

self-study: 207 hours

### Learning type

Lecture, exercise, excursion



## M

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

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

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

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

**Prerequisites**  
None

## M

## 5.35 Module: Internship [M-WIWI-101610]

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

**Credits**  
10

**Recurrence**  
Once

**Language**  
German

**Level**  
3

**Version**  
1

Mandatory			
T-WIWI-102756	Internship	10 CR	Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

### Competence Certificate

The assessment is carried out by the evidence of completed full-time internships of at least 12 weeks with at least 20 working hours per week and a presentation of the internship in the form of a written report on the activities. The internship is not graded.

#### 1. Information on evidence of completed full-time internships:

The internship is proofed by the certificate of the intern's office. The certificate has to be formally correct with official corporate letterhead and handwritten countersigned by a responsible employee of the company.

The certificate must at least contain the following information:

- \* Company / Location
- \* Duration: from ... to ...
- \* Hours of work (weekly)
- \* Working interruption, indicating the vacation and sick days
- \* Department
- \* Headwords to the activities

#### 2. Information on to the presentation:

The internship report should be at least one page (typewritten, not handwritten) for each Location. It must be countersigned by a representative of the intern's office.

### Competence Goal

The student

- has general insight into the essential processes in a company,
- is in a position to identify operation correlations and has the knowledge and skills to facilitate a fast understanding of the processes in the company,
- in addition to practical professional experience and competences, also has key competences such as own initiative, ability to work in a team and communication skills as well as ability to integrate into corporate hierarchies and procedures,
- has the experience to accomplish complex IT and business tasks under realistic conditions within the framework of the relevant legal aspects and while applying the total acquired knowledge (interlaced thinking),
- has an idea of the professional development potential in the economy through pursuit of study-related activities,
- knows the technical and professional requirements in the individually targeted future occupation and can take this knowledge into account for the future planning of his/her studies and career,
- can assess and estimate own technical and professional strengths and weaknesses through his/her evaluation of the company.

### Prerequisites

None

**Content**

Primarily the internship should be done to gain economic and business work experiences. Certainly, the interns are free to integrate technical activities as well. A commercial internship provides an insight into business or administrative processes of business transactions. Therefore departments such as controlling, organizing, marketing and planning appear particularly suitable. It remains the companies and interns left, which stations and areas the intern will eventually go through. But the focus should always be in accordance with operational realities of the company.

Regarding the election of the company, in which the internship is absolved, there are no specific rules. Beside of banks, public administration or international organizations even large industrial companies be considered, because of the technical profile of the Bachelor Programme.

**Recommendation**

None

**Annotation**

Internships, that were completed even before studying may be recognized, if the criteria for recognition are met. After recognition of the compulsory internship, there can be taken a semester off for a voluntary, student-related internship.

Regarding to the election of the company, in which the internship is completed, there are no specific rules. Beside of banks, public administration or international organizations even large industrial companies be considered, because of the technical profile of the Bachelor Programme.

With a view to the future professional career, it is recommended to absolve the internship in a larger, possibly international company.

Vacation days are not figured into the internship.

Only three sick leave days may incurred at all. Any additional sick days are not figured into the internship.

A relevant vocational education of at least two years is accepted as a performance equivalent to the internship.

**Workload**

The total workload for this module is approximately 300 hours.

## M

## 5.36 Module: Introduction in Econometrics [M-WIWI-105203]

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

Credits	Recurrence	Language	Level	Version
5	Each term	German	3	1

Mandatory			
T-WIWI-102736	<a href="#">Economics III: Introduction in Econometrics</a>	5 CR	Schienle

**Competence Certificate**

See course description.

**Competence Goal**

- Familiarity with the basic concepts and methods of econometrics
- Preparation of simple econometric surveys

**Prerequisites**

None.

**Content**

In Economics III [2520016] the students learn about quantitative economic relations. The basic problems of econometrics are applied to simple economic studies.

**Recommendation**

It is recommended to attend the lectures in the following order: Economics I: Microeconomics [2610012], Economics II: Macroeconomics [2600014], Economics III: Introduction in Econometrics [2520016].

**Workload**

The total workload for this module is approximately 150 hours.

M

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

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

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

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

## M

## 5.38 Module: Introduction to Natural Hazards and Risk Analysis [M-WIWI-104838]

**Responsible:** Prof. Dr. Michael Kunz  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
3

Election block: Compulsory Elective Courses (between 9 and 12 credits)			
T-BGU-101500	<a href="#">Introduction to Engineering Geology</a>	5 CR	Blum
T-BGU-103541	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite</a>	3 CR	Rösch, Wursthorn
T-BGU-101681	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences</a>	3 CR	Rösch, Wursthorn
T-BGU-101637	<a href="#">Systems of Remote Sensing, Prerequisite</a>	1 CR	Hinz, Weidner
T-BGU-101638	<a href="#">Procedures of Remote Sensing, Prerequisite</a>	1 CR	Weidner
T-BGU-101636	<a href="#">Remote Sensing, Exam</a>	4 CR	Hinz, Weidner
T-BGU-103542	<a href="#">Procedures of Remote Sensing</a>	3 CR	Weidner
T-PHYS-103525	<a href="#">Geological Hazards and Risk</a>	8 CR	Gottschämmer
T-BGU-101693	<a href="#">Hydrology</a>	4 CR	Zehe
T-PHYS-101092	<a href="#">Climatology</a>	5 CR	Ginete Werner Pinto, Maurer
T-BGU-101814	<a href="#">Project in Applied Remote Sensing</a>	1 CR	Hinz, Weidner
T-PHYS-105594	<a href="#">Exam on Climatology</a>	1 CR	Ginete Werner Pinto
T-BGU-101667	<a href="#">Hydraulic Engineering and Water Management</a>	4 CR	Nestmann

### 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

See German version

### Prerequisites

There are no singular exams for Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66]. Therefore it not possible to choose Remote Sensing [GEOD-BFB-1] and additionally the courses Remote Sensing Systems, Remote Sensing Methods or the project Angewandte Fernerkundung [20267] (because they are already included). See also "Recommendations".

### Content

See German version

### Recommendation

The courses Remote Sensing Systems [20241/42] and Remote Sensing Methods [20265/66] may be chosen as a minimal combination for the exam. However, it is recommended to choose the comprehensive combination Remote Sensing [GEOD-BFB-1], which includes Remote Sensing Systems [20241/42], Remote Sensing Methods [20265/66] and the project Angewandte Fernerkundung [20267].

### Annotation

Students, who successfully completed both modules "Understanding and Prediction of Disasters" I and II (alternatively: one of the modules in Bachelor and Master) can get a certificate of the module coordinator (CEDIM). This certificate lists the successful completed courses within the two modules.

**Workload**

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

## M

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

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

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

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	2 semester	German	3	1

Mandatory			
T-WIWI-102758	<a href="#">Introduction to Operations Research I and II</a>	9 CR	Nickel, Rebennack, Stein

**Competence Certificate**

The assessment of the module is carried out by a written examination (120 minutes) according to Section 4(2), 1 of the examination regulation.

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

**Competence Goal**

The student

- names and describes basic notions of the essential topics in Operations Research (Linear programming, graphs and networks, integer and combinatorial optimization, nonlinear programming, dynamic programming and stochastic models),
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

**Module grade calculation**

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

**Prerequisites**

None

**Content**

This module treats the following topics: linear programming, network models, integer programming, nonlinear programming, dynamic programming, queuing theory, heuristic models.

This module forms the basis of a series of advanced lectures with a focus on both theoretical and practical aspects of Operations Research.

**Workload**

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



## M

## 5.40 Module: Introduction to Programming [M-WIWI-101581]

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

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

Mandatory			
T-WIWI-102735	<a href="#">Introduction to Programming with Java</a>	5 CR	Zöllner

**Competence Certificate**

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

The successful completion of the compulsory tests in the computer lab is prerequisite for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

**Competence Goal**

see german version

**Prerequisites**

None

**Content**

see german version

**Workload**

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

## M

## 5.41 Module: Introduction to Statistics [M-WIWI-101432]

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

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

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

Credits	Recurrence	Duration	Language	Level	Version
10	Each term	2 semester	German	3	2

Mandatory			
T-WIWI-102737	<a href="#">Statistics I</a>	5 CR	Grothe, Schienle
T-WIWI-102738	<a href="#">Statistics II</a>	5 CR	Grothe, Schienle

**Competence Certificate**

The assessment of this module consists of two written examinations according to Section 4(2), 1 of the examination regulation (one for each of the courses Statistics I and II).

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

**Competence Goal**

See German version.

**Module grade calculation**

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

**Prerequisites**

**Notice:** The lecture *Statistics I* [25008/25009] is part of the preliminary examination concerning Section 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

**Content**

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities, transformation of probabilities, parameters of location and dispersion, most important discrete and continuous distributions, covariance and correlation, limit distributions

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

**Workload**

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

**M****5.42 Module: Laboratory Work in Inorganic Chemistry [M-CHEMBIO-104026]****Organisation:** KIT Department of Chemistry and Biosciences**Part of:** [Physics or Chemistry](#)

<b>Credits</b>	<b>Language</b>	<b>Level</b>	<b>Version</b>
7	German	3	1

Mandatory			
T-CHEMBIO-108287	<a href="#">Laboratory Work in General and Inorganic Chemistry</a>	7 CR	

**Prerequisites**

none

## M

## 5.43 Module: Logistics and Supply Chain Management [M-MACH-105298]

**Responsible:** Prof. Dr.-Ing. Kai Furmans

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Language	Level	Version
9	Each summer term	German/English	3	1

Mandatory			
T-MACH-110771	<a href="#">Logistics and Supply Chain Management</a>	9 CR	Furmans

### Competence Certificate

The assessment consists of a 120 minutes written examination (according to §4(2), 1 of the examination regulation).

### Competence Goal

The student

- has comprehensive and well-founded knowledge of the central challenges in logistics and supply chain management, an overview of various practical issues and the decision-making requirements and models in supply chains,
- can model supply chains and logistics systems using simple models with sufficient accuracy,
- identifies cause-effect relationships in supply chains,
- is able to evaluate supply chains and logistics systems based on the methods they have mastered.

### Prerequisites

None

### Content

Logistics and Supply Chain Management provides comprehensive and well-founded fundamentals for the crucial issues in logistics and supply chain management. Within the scope of the lectures, the interaction of different design elements of supply chains is emphasized. For this purpose, qualitative and quantitative description models are used. Methods for mapping and evaluating logistics systems and supply chains are also covered. The lecture contents are enriched by exercises and case studies and partially the comprehension of the contents is provided by case studies. The interacting of the elements will be shown, among other things, in the supply chain of the automotive industry.

### Learning type

Lectures, tutorials, case studies.

### Literature

Knut Alick: Planung und Betrieb von Logistiknetzwerken: Unternehmensübergreifendes Supply Chain Management, 2003

Dieter Arnold et. al.: Handbuch Logistik, 2008

Marc Goetschalkx: Supply Chain Engineering, 2011

## M

## 5.44 Module: Machine Tools and Industrial Handling [M-MACH-101286]

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

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

Mandatory			
T-MACH-102158	<a href="#">Machine Tools and Industrial Handling</a>	9 CR	Fleischer

### Competence Certificate

Written exam (120 minutes)

### Competence Goal

The students

- are able to assess the use and application of machine tools and handling equipment and to differentiate between them in terms of their characteristics and design
- can describe and discuss the essential elements of the machine tool (frame, main spindle, feed axes, peripheral equipment, control unit)
- are able to select and dimension the essential components of a machine tool
- are capable of selecting and evaluating machine tools according to technical and economic criteria.

### Prerequisites

None

### Content

The module overviews the construction, use and application of machine tools and industrial handling equipment. A well-founded and practice-oriented knowledge is imparted about the selection, design and evaluation of machine tools. First, the main components of the machine tools are systematically explained and their design principles as well as the integral machine tool design are discussed. Subsequently, the use and application of machine tools will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0.

The individual topics are:

- Frames and frame components
- Feed axes
- Spindles
- Peripheral equipment
- Control unit
- Metrological evaluation and machine testing
- Process monitoring
- Maintenance of machine tools
- Safety assessment of machine tools
- Machine examples

### Workload

regular attendance: 63 hours

self-study: 207 hours

### Learning type

Lecture, exercise, excursio

## M

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

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	English	3	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

**5.46 Module: Manufacturing Technology [M-MACH-101276]**

**Responsible:** Prof. Dr.-Ing. Volker Schulze  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each winter term	1 semester	German	3	5

Mandatory			
T-MACH-102105	<a href="#">Manufacturing Technology</a>	9 CR	Schulze, Zanger

**Competence Certificate**

Written Exam (180 min)

**Competence Goal**

The students

- can name different manufacturing processes, can describe their specific characteristics and are capable to depict the general function of manufacturing processes and are able to assign manufacturing processes to the specific main groups.
- are enabled to identify correlations between different processes and to select a process depending on possible applications.
- are capable to describe the theoretical basics for the manufacturing processes they got to know within the scope of the course and are able to compare the processes.
- are able to correlate based on their knowledge in materials science the processing parameters with the resulting material properties by taking into account the microstructural effects.
- are qualified to evaluate different processes on a material scientific basis.

**Prerequisites**

None

**Content**

Within this engineering sciences-oriented module the students will get to learn principle aspects of manufacturing technology. Further information can be found at the description of the lecture "Manufacturing Technology".

**Workload**

regular attendance: 63 hours

self-study: 207 hours

**Learning type**

Lectures, exercise, excursion

## M

## 5.47 Module: Material Flow in Logistic Systems [M-MACH-101277]

**Responsible:** Prof. Dr.-Ing. Kai Furmans

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Language	Level	Version
9	Each winter term	German	3	3

Mandatory			
T-MACH-102151	<a href="#">Material Flow in Logistic Systems</a>	9 CR	Furmans

### Competence Certificate

The assessment (Prüfungsleistung anderer Art) consists of the following assignments:

- 40% assessment of the final case study as individual performance,
- 60% semester evaluation which includes working on 5 case studies and defending those (For both assessment types, the best 4 of 5 tries count for the final grade.):
  - 40% assessment of the result of the case studies as group work,
  - 20% assessment of the oral examination during the case study colloquiums as individual performance.

A detailed description of the learning control can be found under T-MACH-102151.

### Competence Goal

The student

- acquires comprehensive and well-founded knowledge on the main topics of logistics, an overview of different logistic questions in practice and knows the functionality of material handling systems,
- is able to illustrate logistic systems with adequate accuracy by using simple models,
- is able to realize coherences within logistic systems,
- is able to evaluate logistic systems by using the learnt methods.

### Prerequisites

none

### Content

The module *Material Flow in Logistic Systems* provides comprehensive and well-founded basics for the main topics of logistics. Within the lectures, the interaction between several components of logistic systems will be shown. The module focuses on technical characteristics of material handling systems as well as on methods for illustrating and evaluating logistics systems. To gain a deeper understanding, the course is accompanied by exercises and case studies.

### Workload

270 hours

### Learning type

Lectures, tutorials.



## M

## 5.48 Module: Mathematics 1 [M-MATH-101676]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** [Mathematics](#)

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

Mandatory			
T-MATH-102260	<a href="#">Mathematics I - Midterm Exam</a>	3,5 CR	Folkers, Hug, Last, Winter
T-MATH-102261	<a href="#">Mathematics I - Final Exam</a>	3,5 CR	Folkers, Hug, Last, Winter

**Competence Certificate**

The assessment consists of two written exams of 60 min each (in accordance with §4(2), 1 of the examination regulations). The first (midterm) exam takes place after half of the course, the second (final) exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed. Resit exams for both exams are offered in the first weeks of the subsequent semester.

**Competence Goal**

Students

- are confident with basic terms and definitions of mathematical language (propositions, sets, number systems, mappings, etc.).
- have a basic knowledge of differentiable calculus for functions of a single variable.

**Module grade calculation**

The examination mark for Mathematics 1 is the average of the marks obtained in the midterm exam and final exam.

**Content**

The course Mathematics 1 is the first part of the three semester basic training in higher mathematics. Topics are

- Propositional logic and basic set theory,
- Combinatorics and principles of counting,
- Number systems and basic arithmetics,
- Systems of linear equations,
- Convergence of sequences and series,
- Mappings and functions,
- Continuous functions,
- Differentiable functions,
- Power series and special functions,
- Taylor's theorem.

**Recommendation**

There are no Prerequisites. We strongly recommend to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

**Workload**

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

## M

## 5.49 Module: Mathematics 2 [M-MATH-101677]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** Mathematics

Credits	Recurrence	Language	Level	Version
7	Each summer term	German	3	1

Mandatory			
T-MATH-102262	Mathematics II - Midterm Exam	3,5 CR	Folkers, Hug, Last, Winter
T-MATH-102263	Mathematics II - Final Exam	3,5 CR	Folkers, Hug, Last, Winter

**Competence Certificate**

The assessment consists of two written exams of 60 min each (in accordance with §4(2), 1 of the examination regulations). The first (midterm) exam takes place after half of the course, the second (final) exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are not allowed. Resit exams for both exams are offered in the first weeks of the subsequent semester.

**Competence Goal**

Students

- know basic concepts of matrix theory.
- have a basic knowledge of integral calculus in a single variable.
- have a basic knowledge of multivariate differential calculus.

**Module grade calculation**

The examination mark for Mathematics 2 is the average of the marks obtained in the midterm exam and final exam.

**Content**

The course Mathematics 2 is the second part of the three semester basic training in higher mathematics. Topics are

- Riemann integral,
- n-dimensional vector spaces,
- scalar product, length and angle,
- linear mappings and matrices,
- determinants,
- eigenvalue theory,
- multivariate calculus.

**Recommendation**

There are no Prerequisites. We strongly recommend to attend the three maths courses in the order Mathematics 1, Mathematics 2, Mathematics 3.

**Workload**

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

## M

## 5.50 Module: Mathematics 3 [M-MATH-101679]

**Responsible:** Prof. Dr. Günter Last  
**Organisation:** KIT Department of Mathematics  
**Part of:** [Mathematics](#)

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

Mandatory			
T-MATH-102264	<a href="#">Mathematics III - Final Exam</a>	7 CR	Folkers, Hug, Last, Winter

**Competence Certificate**

The assessment consists of a written exams of 105 min (in accordance with §4(2), 1 of the examination regulations). The exam takes place shortly after the end of the lectures. Auxiliary means such as literature or calculators are allowed. A resit exam is offered in the first weeks of the subsequent semester.

**Competence Goal**

Students

- are confident with important concepts in the theory of normed vector spaces.
- have some basic knowledge of ordinary differential equations.
- have some basic knowledge of Fourier analysis.

**Module grade calculation**

The examination mark for Mathematics 3 is the mark of the written exam.

**Content**

The course Mathematics 3 is the third part of the three semester basic training in higher mathematics. Topics are

- Multiple integrals,
- Implicit functions,
- General linear spaces,
- Normed vector spaces,
- Banach's fixed point theorem,
- Ordinary differential equations,
- Linear differential equations,
- Fourier analysis,
- Integral transformations.

**Workload**

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

## M

## 5.51 Module: Mechanical Design [M-MACH-101299]

**Responsible:** Prof. Dr.-Ing. Albert Albers  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

<b>Credits</b> 8	<b>Recurrence</b> Each winter term	<b>Language</b> German	<b>Level</b> 3	<b>Version</b> 3
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Mandatory			
T-MACH-110363	<a href="#">Mechanical Design Basics I and II</a>	6 CR	Albers, Matthiesen
T-MACH-110364	<a href="#">Mechanical Design Basics I, Tutorial</a>	1 CR	Albers, Matthiesen
T-MACH-110365	<a href="#">Mechanical Design Basics II, Tutorial</a>	1 CR	Albers, Matthiesen

**Competence Certificate**

Written examination on the contents of Mechanical Design I&II

Duration: 90 min plus reading time

Preliminary examination: Successful participation in the preliminary work in the field of Mechanical Design I&II

**Competence Goal**

Learning object springs:

- be able to recognize spring types and explain stress
- Identify and describe the properties of a resilient LSS in machine elements presented later on
- Understanding and explaining the principle of action
- Know and list areas of application for springs
- graphically illustrate the load and the resulting stresses
- be able to describe the degree of species usefulness as a means of lightweight construction
- be able to analyse different solution variants with regard to lightweight construction (use species efficiency)
- Being able to explain several springs as a circuit and calculate total spring stiffness

Learning objects Technical Systems:

- Being able to explain what a technical system is
- "Thinking in systems."
- Using system technology as an abstraction tool for handling complexity
- Recognizing functional relationships of technical systems
- Getting to know the concept of function
- be able to use C&C<sup>2</sup>-A as a means of system technology

Learning objects Visualization:

- Ability to create and interpret schematics
- Using freehand technical drawing as a means of communication
- To be able to apply the technical basics of freehand drawing
- Derivation of 2D representations into different perspective representations of technical structures and vice versa
- Master reading of technical drawings
- Dedicated dimensioning of technical drawings
- Create sectional views of technical systems as a technical sketch

Learning objects Bearings:

- be able to recognize bearings in machine systems and explain their basic functions
- name bearings (type/type/function) and recognize them in machine systems and technical drawings
- Being able to name areas of application and selection criteria for the various bearings and bearing arrangements and explain interrelationships
- Ability to functionally explain the design of the bearing definitions in different directions radially/axially and circumferentially
- Know and describe selection as an iterative process as an example
- be able to perform dimensioning of bearing arrangements as an example of the engineer's approach to dimensioning machine elements
- Develop first ideas for probabilities in predicting the life of machine elements
- Recognise from the damage pattern whether static or dynamic overload was the cause of material failure
- Calculate equivalent static and dynamic bearing loads from the catalogue and given external forces on the bearing
- Being able to name, explain and transfer the basic equation of the dimensioning to the bearing dimensioning

Learning objectives seals:

The students...

- can discuss the basic functions of seals
- can describe the physical causes for mass transfer
- can apply the C&C-Model on seals
- can name, describe and apply the three most important classification criteria of seals
- can explain the function of a contacting seal and a non-contacting seal.
- can differentiate the seal types and organize them to the classification criteria.
- can discuss the structure and the effect of a radial shaft seal
- can evaluate radial shaft seals, compression packings, mechanical seals, gap seals and labyrinth seals
- can describe and apply the constructional principle of selffortification
- can describe the stick-slip phenomenon during the movement sequences of a reciprocating seal

Learning design:

The students...

- understand the meaning of design
- are able to recognize and implement basic rules and principles of design
- are able to design the connection of partial systems into the total system
- can name requirements of design and take them into account
- know the main groups of manufacturing methods

- are able to explain the manufacturing processes
- are able to depict a casted design in a drawing clearly, e.g. draft of the mold, no material accumulation, ...
- know how components are designed
- Know how the production of the components has an effect on their design
- Know the requirements and boundary conditions on design

Learning bolted connections:

The students...

- can list and explain various bolt applications.
- can recognize bolt types and explain their function
- can build a C&C<sup>2</sup> model of a bolted joint and discuss the influences on its function
- can explain the function of a bolted connection with the help of a spring model
- can reproduce, apply and discuss the screw equation.
- Can estimate the load-bearing capacity of low-loaded bolted joints for dimensioning purposes
- Can indicate which bolted joint is to be calculated and which only roughly dimensioned.
- Can carry out the dimensioning of bolted connections as flange connections
- Can create, explain and discuss the force deflection diagram of a bolted connection

### Prerequisites

None

### Content

#### MKL I:

Introduction to product development

Tools for visualization (technical drawing)

Product creation as a problem solution

Technical Systems Product Development

- Systems theorie
- Contact and Channel Approach C&C<sup>2</sup>-A

Basics of selected construction and machine elements

- Federn
- bearings and fence
- sealings

The lecture is accompanied by exercises with the following content:

gear workshop

Tools for visualization (technical drawing)

Technical Systems Product Development

- Systemtheorie
- Contact amd Channel Approach C&C<sup>2</sup>-A

Exercises for springs

Exercises for bearings and fence

#### MKL II:

- sealings
- design
- dimensioning
- component connections
- bolts

### Recommendation

An in-depth study of machine design (parts 3 + 4) can be carried out as part of the "Extracurricular Module in Engineering".

**Workload****MKL1:**

Attendance at lectures (15 VL): 22,5h

Presence exercises (8 exercises): 12h

Attendance (3x 2h) and preparation (3x3h) Workshop sessions: 15h

Preparation and execution of online test: 6h

Personal preparation and follow-up of lecture and exercise: 34,5h MKL1:

**MKL2:**

Attendance lectures (15 VL): 22,5h

Presence exercises (7 ÜB): 10,5h

Personal preparation and follow-up of lecture and exercise, incl. prerequisite and preparation for the exam:: 117h

**Learning type**

Lecture

Tutorial

Project work during the semester

Online-test

## M

## 5.52 Module: Methodical Foundations of OR [M-WIWI-101414]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(Operations Research\)](#)

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	3	9

Election block: Compulsory Elective Courses (at least 1 item as well as between 4,5 and 9 credits)			
T-WIWI-102726	<a href="#">Global Optimization I</a>	4,5 CR	Stein
T-WIWI-103638	<a href="#">Global Optimization I and II</a>	9 CR	Stein
T-WIWI-102724	<a href="#">Nonlinear Optimization I</a>	4,5 CR	Stein
T-WIWI-103637	<a href="#">Nonlinear Optimization I and II</a>	9 CR	Stein
Election block: Supplementary Courses ()			
T-WIWI-106546	<a href="#">Introduction to Stochastic Optimization</a>	4,5 CR	Rebennack
T-WIWI-102727	<a href="#">Global Optimization II</a>	4,5 CR	Stein
T-WIWI-102725	<a href="#">Nonlinear Optimization II</a>	4,5 CR	Stein
T-WIWI-102704	<a href="#">Facility Location and Strategic Supply Chain Management</a>	4,5 CR	Nickel

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module 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 optimization methods, in particular from nonlinear and from global optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions.

**Prerequisites**

At least one of the courses *Nonlinear Optimization I* [2550111] and *Global Optimization I* [2550134] has to be examined.

**Content**

The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous decision variables. The lectures on nonlinear programming deal with local solution concepts, whereas the lectures on global optimization treat approaches for global solutions.

**Recommendation**

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

**Annotation**

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

**Workload**

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



## M

## 5.53 Module: Microsystem Technology [M-MACH-101287]

**Responsible:** Prof. Dr. Jan Gerrit Korvink  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** Compulsory Elective Modules (Engineering Sciences)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
4

**Version**  
2

Election block: Mikrosystemtechnik (at least 9 credits)			
T-MACH-102165	<a href="#">Selected Topics on Optics and Microoptics for Mechanical Engineers</a>	3 CR	Heckele, Mappes
T-MACH-100967	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</a>	3 CR	Guber
T-MACH-100968	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</a>	3 CR	Guber
T-MACH-102172	<a href="#">Bionics for Engineers and Natural Scientists</a>	3 CR	Hölscher
T-MACH-105182	<a href="#">Introduction to Microsystem Technology I</a>	3 CR	Badilita, Jouda, Korvink
T-MACH-105183	<a href="#">Introduction to Microsystem Technology II</a>	3 CR	Jouda, Korvink
T-MACH-101910	<a href="#">Microactuators</a>	3 CR	Kohl
T-MACH-102080	<a href="#">Nanotechnology with Clusterbeams</a>	3 CR	Gspann
T-MACH-102152	<a href="#">Novel Actuators and Sensors</a>	4 CR	Kohl, Sommer
T-ETIT-101907	<a href="#">Optoelectronic Components</a>	4 CR	Freude
T-MACH-100530	<a href="#">Physics for Engineers</a>	6 CR	Dienwiebel, Gumbsch, Nesterov-Müller, Weygand
T-MACH-102164	<a href="#">Practical Training in Basics of Microsystem Technology</a>	3 CR	Last

### 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

construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

### Prerequisites

Successful passing of the corresponding modules of the basic program.

### Content

The module offers courses in microsystem technology. Knowledge is imparted in various fields like basics in construction and production of e. g. mechanical, optical, fluidic and sensory microsystems.

### Workload

270 hours

## M

## 5.54 Module: Mobility and Infrastructure [M-BGU-101067]

**Responsible:** Prof. Dr.-Ing. Ralf Roos  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	1 semester	German	3	2

Mandatory			
T-BGU-101791	<a href="#">Mobility and Infrastructure</a>	9 CR	Roos, Vortisch

**Prerequisites**

none

**Recommendation**

For students from the KIT-Department of Economics and Management it is recommended to take part in the excercises.

**Annotation**

none

## M

## 5.55 Module: Module Bachelor Thesis [M-WIWI-101612]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Bachelor Thesis

Credits	Recurrence	Language	Level	Version
12	Once	German	3	5

Mandatory			
T-WIWI-103096	Bachelor Thesis	12 CR	Ruckes

**Competence Certificate**

The Bachelor Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Industrial Engineering and Management. The Bachelor Thesis is described in detail in § 11 (SPO 2007) and § 14 (SPO 2015) of the examination regulation. The review is carried out

- according to SPO 2007 by at least one examiner of the Department of Economics and Management, or, after approval by at least one examiner of another faculty. 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.
- according to SPO 2015 by at least two examiners of the Department of Economics and Management.

The regular processing time takes three/six months (SPO 2007/SPO2015). On a reasoned request of the student, the examination board can extend the processing time of a maximum of one month. If the Bachelor Thesis is not completed in time, this exam is "failed", unless the student is not being responsible (eg maternity leave).

With consent of the examiner the thesis can be written in English as well. Other languages require besides the consent of the examiner the approval of the examination board. The issue of the Bachelor Thesis may only be returned once and only within the first month of processing time. A new topic has to be released within four weeks.

The overall grade of the module is the grade of the Bachelor Thesis.

**Competence Goal**

The student can independently work on a relevant topic in accordance with scientific criteria within the specified time frame.

He/she is in a position to research, analyze the information, abstract and identify basic principles and regulations from less structured information.

He/she reviews the task ahead, can select scientific methods and techniques and apply them to solve a problem or identify further potential. This is basically also done under consideration of social and/or ethical aspects.

He/she can interpret, evaluate and if required, graphically present the obtained results.

He/she is in a position to clearly structure a research paper and communicate in writing using the technical terminology.

**Prerequisites**

Prerequisites for admission to the Bachelor Thesis:

- according to SPO 2007: the student is in the 3rd Academic year (5th and 6th semester) and has not been completed at most one of the exams of the basic program.
- according to SPO 2015: A minimum of 120 credits must be earned. All module examinations of the basic program must be passed.

At the request of the student, the examination committee decides on exceptions to these regulations.

It is recommended to begin the Bachelor Thesis in the 5th or 6th Semester.

A written confirmation of the examiner about supervising the Bachelor's Thesis is required.

Please pay regard to the institute specific rules for supervising a Bachelor Thesis.

The Bachelor Thesis has to contain the following declaration: "I hereby declare that I produced this thesis without external assistance, and that no other than the listed references have been used as sources of information. Passages taken literally or analogously from published or non published sources are marked as this." If this declaration is not given, the Bachelor Thesis will not be accepted.

**Content**

The Bachelor Thesis is the first major scientific work. The topic of the Bachelor Thesis will be chosen by the student themselves and adjusted with the examiner. The topic has to be related to Economics Engineering and has to refer to subject-specific or interdisciplinary problems.

**Recommendation**

None

**Workload**

See German version.

## M

## 5.56 Module: Optimization under Uncertainty [M-WIWI-103278]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(Operations Research\)](#)

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

Election block: Compulsory Elective Courses (between 1 and 2 items)			
T-WIWI-106546	<a href="#">Introduction to Stochastic Optimization</a>	4,5 CR	Rebennack
T-WIWI-106545	<a href="#">Optimization under Uncertainty</a>	4,5 CR	Rebennack
Election block: Supplementary Courses (at most 1 item)			
T-WIWI-102724	<a href="#">Nonlinear Optimization I</a>	4,5 CR	Stein
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

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

**Prerequisites**

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

**Content**

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

**Recommendation**

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

**Annotation**

The curriculum, planned for three years in advance, can be found on the Internet at <http://sop.iior.kit.edu/28.php>.

**Workload**

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

## M

## 5.57 Module: Power Network [M-ETIT-102379]

**Responsible:** Dr.-Ing. Bernd Hoferer  
Prof. Dr.-Ing. Thomas Leibfried

**Organisation:** KIT Department of Electrical Engineering and Information Technology

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

Credits	Recurrence	Language	Level	Version
9	Each winter term	German	3	3

Mandatory			
T-ETIT-101923	<a href="#">Electric Energy Systems</a>	5 CR	Leibfried
T-ETIT-100830	<a href="#">Power Network</a>	6 CR	Leibfried

M

## 5.58 Module: Preliminary Exam [M-WIWI-101726]

**Organisation:** University

**Part of:** Preliminary Exam

**Credits**  
0

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
1

Mandatory			
T-WIWI-102737	<a href="#">Statistics I</a>	5 CR	Grothe, Schienle
T-WIWI-102708	<a href="#">Economics I: Microeconomics</a>	5 CR	Puppe, Reiß

**Modelled deadline**

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

**Prerequisites**

none

## M

## 5.59 Module: Private Business Law [M-INFO-101216]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
3

Election block: Private Business Law (at least 1 item as well as at least 9 credits)			
T-INFO-101329	<a href="#">Employment Law I</a>	3 CR	Dreier
T-INFO-101330	<a href="#">Employment Law II</a>	3 CR	Dreier
T-INFO-101315	<a href="#">Tax Law I</a>	3 CR	Dreier
T-INFO-101314	<a href="#">Tax Law II</a>	3 CR	Dietrich, Dreier
T-INFO-101316	<a href="#">Law of Contracts</a>	3 CR	Dreier

**Competence Goal**

The student

- has gained in-depth knowledge of German company law, commercial law and civil law;
- is able to analyze, evaluate and solve complex legal and economic relations and problems;
- is well grounded in individual labour law, collective labour law and commercial constitutional law, evaluates and critically assesses clauses in labour contracts;
- recognizes the significance of the parties to collective labour agreements within the economic system and has differentiated knowledge of labour disputes law and the law governing the supply of temporary workers and of social law;
- possesses detailed knowledge of national earnings and corporate tax law and is able to deal with provisions of tax law in a scientific manner and assesses the effect of these provisions on corporate decision-making.

**Prerequisites**

None

**Content**

The module provides the student with knowledge in special matters in business law, like employment law, tax law and business law, which are essential for managerial decisions.



**M 5.60 Module: Product Lifecycle Management [M-MACH-101270]**

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Duration</b> 1 semester	<b>Language</b> German	<b>Level</b> 4	<b>Version</b> 3
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Election block: Product Lifecycle Management (Kernbereich) (1 item)			
T-MACH-105147	<a href="#">Product Lifecycle Management</a>	4 CR	Ovtcharova
Election block: Product Lifecycle Management (2 items)			
T-MACH-102153	<a href="#">PLM-CAD Workshop</a>	4 CR	Ovtcharova
T-MACH-102181	<a href="#">PLM for Product Development in Mechatronics</a>	4 CR	Eigner
T-MACH-102209	<a href="#">Information Engineering</a>	3 CR	Ovtcharova
T-MACH-106744	<a href="#">Agile Product Innovation Management - Value-driven Planning of New Products</a>	4 CR	Kläger
T-MACH-106457	<a href="#">I4.0 Systems Platform</a>	4 CR	Maier, Ovtcharova
T-MACH-102083	<a href="#">Integrated Information Systems for Engineers</a>	4 CR	Ovtcharova
T-MACH-102155	<a href="#">Product, Process and Resource Integration in the Automotive Industry</a>	4 CR	Mbang
T-MACH-102149	<a href="#">Virtual Reality Practical Course</a>	4 CR	Ovtcharova
T-MACH-102187	<a href="#">CAD-NX Training Course</a>	2 CR	Ovtcharova

**Competence Certificate**

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

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

**Competence Goal**

The students should:

- have basic knowledge about the challenges in product and process data management regarding the whole product lifecycle;
- have understanding about challenges and functional concepts of product lifecycle management;
- be able to rudimental operate common PLM/CAX/VR - systems,
- develop and present prototype solutions in teams of different domains.

**Prerequisites**

None

**Content**

Product Lifecycle Management (PLM), Generation and management of information, Architecture and functionality of information systems, Industry 4.0, CAX and VR-systems.

**Workload**

270 hours

## M

**5.61 Module: Public Business Law [M-INFO-101217]**

**Responsible:** Dr. Tristan Barczak  
**Organisation:** KIT Department of Informatics  
**Part of:** *Compulsory Elective Modules (Law or Sociology)*

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

Election block: Public Business Law (at least 1 item as well as at least 9 credits)			
T-INFO-101309	<a href="#">Telecommunications Law</a>	3 CR	Marsch
T-INFO-101303	<a href="#">Data Protection Law</a>	3 CR	Marsch
T-INFO-101311	<a href="#">Public Media Law</a>	3 CR	Dreier
T-INFO-101312	<a href="#">European and International Law</a>	3 CR	Brühann
T-INFO-101348	<a href="#">Environmental Law</a>	3 CR	Barczak

**Competence Certificate**

see course description.

## M

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

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German	3	5

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102877	<a href="#">Introduction to Public Finance</a>	4,5 CR	Wigger
T-WIWI-108711	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	<a href="#">Public Revenues</a>	4,5 CR	Wigger
T-WIWI-109590	<a href="#">Public Sector Finance</a>	4,5 CR	Wigger

**Competence Certificate**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are 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**

See German version.

**Content**

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

**Recommendation**

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

**Annotation**

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

**Workload**

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

## M

## 5.63 Module: Real Estate Management [M-WIWI-101466]

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)  
[Compulsory Elective Modules \(Business Administration\)](#)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German	3	2

Mandatory			
T-WIWI-102744	<a href="#">Real Estate Management I</a>	4,5 CR	Lützkendorf
T-WIWI-102745	<a href="#">Real Estate Management II</a>	4,5 CR	Lützkendorf

**Competence Certificate**

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

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

**Competence Goal**

The student

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

**Prerequisites**

None

**Content**

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

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

**Recommendation**

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

Furthermore a combination with courses in the area of

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

is recommended.

**Workload**

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

## M

## 5.64 Module: Seminar Module [M-WIWI-101816]

**Responsible:** Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [Compulsory Elective Modules \(mandatory\)](#)

**Credits**  
3

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
5

Election block: Compulsory Elective Courses (3 credits)			
T-WIWI-103486	<a href="#">Seminar in Business Administration (Bachelor)</a>	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103485	<a href="#">Seminar in Informatics (Bachelor)</a>	3 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-108763	<a href="#">Seminar in Engineering Science Master (approval)</a>	3 CR	Fachvertreter ingenieurwissenschaftlicher Fakultäten
T-MATH-102265	<a href="#">Seminar in Mathematics (Bachelor)</a>	3 CR	Folkers, Last
T-WIWI-103488	<a href="#">Seminar in Operations Research (Bachelor)</a>	3 CR	Nickel, Rebennack, Stein
T-INFO-101997	<a href="#">Seminar: Legal Studies I</a>	3 CR	Dreier
T-WIWI-103489	<a href="#">Seminar in Statistics (Bachelor)</a>	3 CR	Grothe, Schienle
T-WIWI-103487	<a href="#">Seminar in Economics (Bachelor)</a>	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>	3 CR	Furmans, Pagani
T-MACH-109062	<a href="#">Seminar Production Technology</a>	3 CR	Fleischer, Lanza, Schulze
T-MACH-108737	<a href="#">Seminar Data-Mining in Production</a>	3 CR	Lanza

### Competence Certificate

**SPO 2015:** The modul examination consists of **one** seminar (according to §4 (3), 3 of the examintaion regulation). A detailed description of the assessment is given in the specific course characerization.

**SPO 2007:**The modul examination consists of **two** seminars and of at least one **key qualification** (KQ) course (according to §4 (3), 3 of the examintaion regulation). As key qualification one of the following courses must be chosen: Academic Learning HoC (2-3 credits), Key Qualifikations ZAK (1-3 credits), Elective „Educational development for student teachers“ (2-3 credits) or language courses SpZ. A detailed description of every singled assessment is given in the specific course characerization.

### 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

All modules of the basic program should be completed. For further information see German version.

### Content

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.

Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailed description o these qualifications is given in the section “Key Qualifications” of the module handbook.

Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

**Workload**

See German version.

## M

## 5.65 Module: Sociology/Empirical Social Research [M-GEISTSOZ-101167]

**Responsible:** Prof. Dr. Gerd Nollmann  
**Organisation:** KIT Department of Humanities and Social Sciences  
**Part of:** [Compulsory Elective Modules \(Law or Sociology\)](#)

Credits	Recurrence	Language	Level	Version
9	Each winter term	German	3	2

Mandatory			
T-GEISTSOZ-109047	<a href="#">Analysis of Social Structures (WiWi)</a>	3 CR	Nollmann
T-GEISTSOZ-109048	<a href="#">Social Science A (WiWi)</a>	3 CR	Nollmann
T-GEISTSOZ-109049	<a href="#">Social Science B (WiWi)</a>	3 CR	Nollmann

**Competence Goal**

The student

- Gains theoretical and methodical knowledge of social processes and structures
- Is able to apply acquired knowledge practically
- Is able to present work results in a precise and clear way

**Content**

This module offers students the possibility to get to know research problems and to answer these theoretically as well as empirically. For example: Who does earn how much in his job and why? How do subcultures emerge? Why are boys' grades in school always worse than those of girls? Do divorces have negative influences on the development of children? How does mass consumption influence the individual? Is there a world society emerging? In addition, this module contains courses on sociological methods that are essential to answer such questions scientifically.

The lecture on social structure analysis gives an overview of large social structures such as the education system, labour market, institutions, demography, etc. for Germany and in international comparison. The content of the social research seminars is determined individually by the lecturers. Students are free to choose one seminar each for Social Research A/B.

**M 5.66 Module: Specialization in Production Engineering [M-MACH-101284]**

**Responsible:** Prof. Dr.-Ing. Volker Schulze  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

<b>Credits</b> 9	<b>Recurrence</b> Each term	<b>Language</b> German	<b>Level</b> 4	<b>Version</b> 3
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<b>Election block: Vertiefung der Produktionstechnik (at least 9 credits)</b>			
T-MACH-110176	<a href="#">Digitalization from Production to the Customer in the Optical Industry</a>	4 CR	Wawerla
T-MACH-105188	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>	4 CR	Schlichtenmayer
T-MACH-105783	<a href="#">Learning Factory "Global Production"</a>	4 CR	Lanza
T-MACH-108878	<a href="#">Laboratory Production Metrology</a>	4 CR	Häfner
T-MACH-110318	<a href="#">Product- and Production-Concepts for modern Automobiles</a>	4 CR	Kienzle, Steegmüller
T-MACH-102107	<a href="#">Quality Management</a>	4 CR	Lanza
T-MACH-105185	<a href="#">Control Technology</a>	4 CR	Gönnheimer
T-MACH-105177	<a href="#">Metal Forming</a>	3 CR	Herlan
T-MACH-102148	<a href="#">Gear Cutting Technology</a>	4 CR	Klaiber

**Competence Certificate**

Oral exams: duration approx. 5 min per credit point

Written exams: duration approx. 20 - 25 min per credit point

Amount, type and scope of the success control can vary according to the individually choice.

**Competence Goal**

The students

- are able to apply the methods of production science to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques for a specific problem.
- are able to use their knowledge target-oriented to achieve an efficient production technology.
- are able to analyze new situations and choose methods of production science target-oriented based on the analyses, as well as justifying their selection.
- are able to describe and compare complex production processes exemplarily.

**Prerequisites**

none

**Content**

Within this module the students will get to know and learn about production science. Manifold lectures and excursions as part of several lectures provide specific insights into the field of production science.

**Workload**

The work load is about 270 hours, corresponding to 9 credit points.

**Learning type**

Lectures, seminars, workshops, excursions



## M

## 5.67 Module: Statistics and Econometrics [M-WIWI-101608]

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

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

**Part of:** [Economics \(Specialisation Program Economics\)](#)  
[Compulsory Elective Modules \(Economics\)](#)  
[Compulsory Elective Modules \(Statistics\)](#)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-103064	<a href="#">Financial Econometrics</a>	4,5 CR	Schienle
T-WIWI-103063	<a href="#">Analysis of Multivariate Data</a>	4,5 CR	Grothe
T-WIWI-103065	<a href="#">Statistical Modeling of Generalized Regression Models</a>	4,5 CR	Heller
T-WIWI-103066	<a href="#">Data Mining and Applications</a>	4,5 CR	Nakhaeizadeh

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

**Content**

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

**Recommendation**

None

**Annotation**

New module starting winter term 2015/2016. It replaces the old module "Statistical Applications of Financial Risk Management" [WW3STAT].

**Workload**

The total workload for this module is approximately 270 hours.

## M

## 5.68 Module: Strategy and Organization [M-WIWI-101425]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Business Administration (Specialisation Program Business Administration)  
 Compulsory Elective Modules (Business Administration)

**Credits**  
9

**Recurrence**  
Each term

**Language**  
German

**Level**  
3

**Version**  
4

Election block: Strategy and Organization (at least 9 credits)			
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
T-WIWI-102871	Problem Solving, Communication and Leadership	2 CR	Lindstädt
T-WIWI-102629	Management and Strategy	3,5 CR	Lindstädt

### Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 describes both central concepts of strategic management as well as concepts and models for the design of organizational structures.
- He / she evaluates the strengths and weaknesses of existing organizational structures and regulations on the basis of systematic criteria.
- The management of organizational changes discusses and examines the students by means of case studies to what extent the models can be used in practice and what conditions must apply to them.
- In addition, students plan to use IT to support corporate governance.

### Content

The module has a practical and action-oriented structure and provides the student with an up-to-date overview of basic skills concepts and models of strategic management and a realistic picture of possibilities and limitations rational design approaches of the organization.

The focus is firstly on internal and external strategic analysis, concept and sources of competitive advantage, Formulation of competitive and corporate strategies as well as strategy assessment and implementation. Secondly strengths and weaknesses of organizational structures and regulations are assessed on the basis of systematic criteria. Concepts for the organization of organizational structures, the regulation of organizational processes and the control organizational changes are presented.

### Workload

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

## M

## 5.69 Module: Supply Chain Management [M-WIWI-101421]

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

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

Mandatory			
T-WIWI-109936	<a href="#">Platform Economy</a>	4,5 CR	Dorner, Weinhardt
Election block: Supplementary Courses (1 item)			
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**

This module is only available in the elective field. In the specialization program Business Administration, the election is not permitted.

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

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

**Competence Goal**

The students

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

**Prerequisites**

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

**Content**

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

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

**Annotation**

The planned lectures in the next terms can be found on the websites of the respective institutes IISM, IFL and IOR.

**Workload**

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

## M

## 5.70 Module: Technical Logistics [M-MACH-101279]

**Responsible:** Prof. Dr.-Ing. Kai Furmans  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [Compulsory Elective Modules \(Engineering Sciences\)](#)

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

Mandatory			
T-MACH-109919	<a href="#">Basics of Technical Logistics I</a>	4 CR	Mittwollen, Oellerich
T-MACH-109920	<a href="#">Basics of Technical Logistics II</a>	5 CR	Hochstein

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

T-MACH-109920 "Basics of Technical Logistics II" is based on T-MACH-109919 "Basics of Technical Logistics I". The contents are taught one after the other in one course in the winter semester. The individual exams are taken on one day at the end of the semester.

**Competence Goal**

The student

- acquires well-founded knowledge on the main topics of technical logistics
- gets an overview of different applications of technical logistics in practice,
- acquires expertise and understanding about functionality of material handling systems.

**Prerequisites**

none

**Content**

The module *Technical Logistics* provides in-depth basics on the main topics of technical logistics. The module focuses on technical characteristics of material handling technology. To gain a deeper understanding, the course is accompanied by exercises.

**Workload**

270 hours

**Learning type**

Lecture

## M

## 5.71 Module: Topics in Finance I [M-WIWI-101465]

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

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

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	3	8

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

**Prerequisites**

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

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

**Content**

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

**Annotation**

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

**Workload**

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

## M

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

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

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

**Part of:** Business Administration (Specialisation Program Business Administration)  
Compulsory Elective Modules (Business Administration)

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

Election block: Compulsory Elective Courses (9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-110797	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

**Competence Certificate**

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module 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 advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

**Prerequisites**

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

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

**Content**

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

**Annotation**

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

**Workload**

The total workload for this module is approximately 270 hours.

## 6 Courses

T

## 6.1 Course: Advanced Lab Informatics (Master) [T-WIWI-110541]

**Responsible:** Professorenschaft des Fachbereichs Informatik

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

**Part of:** M-WIWI-101426 - Electives in Informatics

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

Events					
WS 19/20	2512301	Linked Data and the Semantic Web	3 SWS		Sure-Vetter, Acosta Deibe, Käfer, Heling
WS 19/20	2512501	Project lab Cognitive automobiles and robots	3 SWS	Practical course (P)	Zöllner
WS 19/20	2512600	Project lab Information Service Engineering	2 SWS	Practical course (P)	Sack
SS 2020	2512204	Lab Business Information Systems: Realisation of innovative services (Bachelor)	3 SWS	Practical course (P)	Oberweis, Schiefer, Schüler, Toussaint
SS 2020	2512400	Development of Sociotechnical Information Systems (Bachelor)	3 SWS	Practical course (P)	Sunyaev, Sturm
SS 2020	2512402	Praktikum Blockchain und Distributed Ledger Technology (Bachelor)	SWS	Practical course (P)	Sunyaev, Beyene, Kannengießler, Pandl
SS 2020	2512554	Practical lab Security, Usability and Society (Bachelor)	3 SWS	Practical course (P)	Volkamer, Strufe, Mayer, Mossano
Exams					
WS 19/20	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 19/20	7900046	Sicherheit		Prüfung (PR)	Volkamer
WS 19/20	7900102	Advanced Lab Information Service Engineering		Prüfung (PR)	Sack
WS 19/20	7900107	Advanced Lab Cognitive Automobile and Robots		Prüfung (PR)	Zöllner
WS 19/20	7900115	Development of Sociotechnical Information Systems		Prüfung (PR)	Sunyaev
WS 19/20	7900116	Advanced Lab Security, Usability and Society		Prüfung (PR)	Volkamer
WS 19/20	7900187	Real-World Challenges in Data Science und Analytics		Prüfung (PR)	Sure-Vetter
SS 2020	7900016	Development of Sociotechnical Information Systems (Bachelor)		Prüfung (PR)	Sunyaev
SS 2020	7900029	Practical lab Security, Usability and Society (Bachelor)		Prüfung (PR)	Volkamer
SS 2020	7900085	Advanced Lab in Information Systems: Realization of innovative services (Bachelor)		Prüfung (PR)	Oberweis
SS 2020	7900096	Lab Blockchain and Distributed Ledger Technology (Bachelor)		Prüfung (PR)	Sunyaev

### Competence Certificate

The alternative exam assessment consists of:

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

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

**Prerequisites**

None

**Annotation**

The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at <https://portal.wiwi.kit.edu>.

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

**Linked Data and the Semantic Web**2512301, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)**Content**

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

**Project lab Cognitive automobiles and robots**2512501, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)**Practical course (P)**



**Content**

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

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

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

**Learning objectives:**

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

**Recommendations:**

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

**Workload:**

The workload of 4.5 credit points consists of the time spent in the lab for practical implementation of the selected solution, as well as the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

**Project lab Information Service Engineering**

2512600, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Practical course (P)

**Content**

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

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

Required coursework includes:

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

**Notes:**

The ISE project course can also be credited as a **seminar**.

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

The project course will be restricted to 15 participants.

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

**ISE Tutor Team:**

- Dr. Mehwish Alam
- M. Sc. Rima Türker
- M. Sc. Russa Biswas
- M. Sc. Fabian Hoppe
- M. Sc. Genet Asefa Gesese
- B. Sc. Tabea Tietz

**Lab Business Information Systems: Realisation of innovative services (Bachelor)**

2512204, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)

**Content**

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

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



### Development of Sociotechnical Information Systems (Bachelor)

2512400, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)

#### Content

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

Registration information will be announced on the course page.



### Practical lab Security, Usability and Society (Bachelor)

2512554, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)

#### Content

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies.

Important dates:

Kick-off: April 24th, 2020, 14: 00-15: 30 Get. 5.20 Room 3A-11.1

Final submission : TBA

Presentation : TBA

Subjects:

#### Privacy-friendly apps

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

#### Programming Usable Security Intervention

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

#### Conducting Usable Security User studies (online studies only)

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

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

As reported on the KIT informational page for the Corona outbreak ( <https://www.kit.edu/kat/25911.php> ), all teaching and in-person contact are forbid until new noticed. If the KIT restrictions are still in effect on the kick-off date, this will still take place at the date and time programmed, albeit in an online form.

In any case, we will inform you promptly as soon a more precise decision is reached.

## T

## 6.2 Course: Advanced Lab Security [T-WIWI-109786]

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

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

Events					
WS 19/20	2512100	<a href="#">Security</a>	4 SWS	Practical course (P)	Baumgart, Volkamer, Mayer, Zarei
Exams					
WS 19/20	7900046	<a href="#">Sicherheit</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

**Recommendation**

Knowledge from the lecture "Information Security" is recommended.

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

## V

**Security**

2512100, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

**Practical course (P)**

**Content**

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

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

More information on [https://ilias.studium.kit.edu/goto\\_produkativ\\_crs\\_998421.html](https://ilias.studium.kit.edu/goto_produkativ_crs_998421.html)

## T

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

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

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

Events					
WS 19/20	2512551	<a href="#">Practical lab Security, Usability and Society</a>	3 SWS	Practical course (P)	Volkamer, Landesberger von Antburg, Mayer
SS 2020	2512554	<a href="#">Practical lab Security, Usability and Society (Bachelor)</a>	3 SWS	Practical course (P)	Volkamer, Strufe, Mayer, Mossano
Exams					
WS 19/20	7900116	<a href="#">Advanced Lab Security, Usability and Society</a>		Prüfung (PR)	Volkamer
SS 2020	7900029	<a href="#">Practical lab Security, Usability and Society (Bachelor)</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

**Recommendation**

Knowledge from the lecture "Information Security" is recommended.

**Annotation**

The course is expected to be offered from winter term 2018/2019.

**Contents:**

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

**Learning goals:**

The student

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

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

## V

**Practical lab Security, Usability and Society**

2512551, WS 19/20, 3 SWS, [Open in study portal](#)

Practical course (P)

**Content**

Kick-off Meeting (compulsory attendance) on 18.10.2019 at 11:00 in room 3A-11.2

**Practical lab Security, Usability and Society (Bachelor)**2512554, SS 2020, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)

**Content**

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies.

Important dates:

Kick-off: April 24th, 2020, 14: 00-15: 30 Get. 5.20 Room 3A-11.1

Final submission : TBA

Presentation : TBA

Subjects:

**Privacy-friendly apps**

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

**Programming Usable Security Intervention**

In this subject, students develop a part of coding, an extension, or another programming task dealing with various usable security interventions, eg as an extension. Eg TORPEDO ( <https://secuso.aifb.kit.edu/english/TORPEDO.php> ) or PassSec + ( <https://secuso.aifb.kit.edu/english/PassSecPlus.php> ). Just as before, students are provided with a point list of goals, containing both basic features mandatory to pass the course and more advanced ones that heighten the final grade.

**Conducting Usable Security User studies (online studies only)**

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

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

As reported on the KIT informational page for the Corona outbreak ( <https://www.kit.edu/kit/25911.php> ), all teaching and in-person contact are forbid until new noticed. If the KIT restrictions are still in effect on the kick-off date, this will still take place at the date and time programmed, albeit in an online form.

In any case, we will inform you promptly as soon a more precise decision is reached.

T

## 6.4 Course: Advanced Programming - Application of Business Software [T-WIWI-102748]

**Responsible:** Prof. Dr. Stefan Klink  
Prof. Dr. Andreas Oberweis

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

**Part of:** [M-WIWI-105112 - Applied Informatics](#)

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

Events					
WS 19/20	2511026	<a href="#">Advanced Programming - Application of Business Software</a>	2 SWS	Lecture (V)	Klink
WS 19/20	2511027	<a href="#">Exercises Advanced Programming - Application of Business Software</a>	1 SWS	Practice (Ü)	Klink, Ullrich, Schreiber
WS 19/20	2511028	<a href="#">Computer lab Advanced Programming - Application of Business Software</a>	2 SWS	Practice (Ü)	Ullrich, Schreiber
Exams					
WS 19/20	7900019	<a href="#">Advanced Programming - Application of Business Software</a>		Prüfung (PR)	
SS 2020	7900049	<a href="#">Advanced Programming - Application of Business Software (Registration until 21 June 2020)</a>		Prüfung (PR)	Klink

### Competence Certificate

The success control takes place in the form of a written examination in the amount of 90 minutes. The examination is offered every semester and can be repeated at any regular examination date.

The prerequisite for taking the exam is successful participation in a computer lab. Attendance is compulsory for individual dates of the lab. More detailed information on participation in the exercises and labs will be announced in the first lecture hour and on the lecture homepage.

Admission can only be acquired in the winter semester and is valid indefinitely.

### Prerequisites

This course cannot be taken together with *Advanced Programming - Java Network Programming*.

### Recommendation

Knowledge of the course "Grundlagen der Informatik I und II" are helpful.

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

V

### Advanced Programming - Application of Business Software

2511026, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Business information systems enable, support, and accelerate new forms of business processes and forms of organisation. They are the central infrastructure of the economy in the age of eBusiness. Thus, basic knowledge is given in lectures, in excersises and in the computer lab which deals with installation, configuration and parameterization of busines information systems. The course communicates profund knowledge in following topics:

- Analysis of cooperation scenarios and business process scenarios
- Selection of modelling methods according to defined criteria
- Implementation of business process modells and cooperation modells with the help of standard software
- Identification and assessment of challenges during the installation of information systems
- Economical evaluation of business information systems.

This course cannot be taken together with *Advanced Programming - Java Network Programming* [2511020].

**Learning objectives:**

Students

- explain basic concepts and principles of enterprise information systems,
- describe the components of enterprise information systems,
- assess economical aspects of such systems,
- asseapply standard software for modelling busines processes and for analysing them to given criteria.

**Recommendations:**

Knowledge of the course "Grundlagen der Informatik I und II" are helpful.

**Workload:**

- Lecture 30h
- Exercise course 17h
- Review and preparation of lectures 23h
- Review and preparation of exercises 10h
- Computer Lab 30h
- Exam preparation 26h
- Exam 1h
- Total 150 h
- Exercise courses are done by student tutors (size about 50 students)

**Literature**

- Schönthaler, Vossen, Oberweis, Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.
- Hasenkamp, Stahlknecht: Einführung in die Wirtschaftsinformatik. Springer 2012.
- Hansen, Neumann: Wirtschaftsinformatik I. Grundlagen betrieblicher Informationsverarbeitung. UTB 2009.
- Mertens et al.: Grundzüge der Wirtschaftsinformatik. Springer 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

## T

## 6.5 Course: Advanced Programming - Java Network Programming [T-WIWI-102747]

**Responsible:** Prof. Dr. Dietmar Ratz  
Prof. Dr.-Ing. Johann Marius Zöllner

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

**Part of:** [M-WIWI-105112 - Applied Informatics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	3

Events					
SS 2020	2511020	<a href="#">Advanced Programming - Java Network Programming</a>	2 SWS	Lecture (V)	Ratz
SS 2020	2511021	<a href="#">Tutorium zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java</a>	1 SWS	Tutorial (Tu)	Ratz, Struppek, Ulrich
SS 2020	2511023	<a href="#">Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java</a>	2 SWS		Ratz, Struppek, Ulrich
Exams					
WS 19/20	7900020	<a href="#">Advanced Programming - Java Network Programming</a>		Prüfung (PR)	
SS 2020	7900041	<a href="#">Advanced Programming - Java Network Programming (Registration until 05 July 2020)</a>		Prüfung (PR)	Ratz

**Competence Certificate**

At the end of the lecture period, a written examination (90 min.) (according to §4(2), 1 SPO) will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

This course cannot be taken together with *Advanced Programming - Application of Business Software* [2511026].

**Annotation**

The registration for the participation in the computer lab (precondition for the exam participation) already takes place in the first lecture week!

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

## V

**Advanced Programming - Java Network Programming**

2511020, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



**Content**

In the lecture, the exercises and computer labs to this course the practical handling with the programming language Java dominating within the range of economical applications is obtained. The basis for this is the current language standard. The knowledge from the lecture Introduction to Programming with Java will be deepened and extended. This is done, among other things, by addressing commercially relevant topics such as object-oriented modeling and programming, class hierarchy and inheritance, threads, applications and applets, AWT and Swing components for graphical user interfaces, exception and event processing, lambda expressions, input/output via streams, applications in networks, Internet communication, client and server programming, remote method invocation, servlets, Java Server Pages and Enterprise Java Beans.

This course cannot be taken together with *Advanced Programming - Application of Business Software* [2540886/2590886].

**Learning objectives:**

- Students learn the practical use of the object-oriented programming language Java and are enabled to design and implement component-based Internet applications using the latest technologies and tools.
- The ability to select and design these methods and systems appropriate to the situation and to use them for solving problems is imparted.
- Students are empowered to find strategic and creative answers in the search for solutions to well-defined, concrete and abstract problems.

**Workload:**

The total workload for this course is approximately 150 hours.

**Literature**

D. Ratz, J. Scheffler, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage, Hanser 2011.

**Weiterführende Literatur:**

- S. Zakhour, S. Hommel, J. Royal. Das Java Tutorial. Addison Wesley 2007
- W. Eberling, J. Lessner. Enterprise JavaBeans 3. Hanser Verlag 2007.
- R. Oechsle. Parallele und verteilte Anwendungen. 2. Auflage. Hanser Verlag 2007.
- Weitere Literatur wird in der Vorlesung bekannt gegeben.

## T

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

**Responsible:** Prof. Dr. Kay Mitusch  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
SS 2020	2520527	<a href="#">Advanced Topics in Economic Theory</a>	2 SWS	Lecture (V)	Mitusch, Scheffel
SS 2020	2520528	<a href="#">Übung zu Advanced Topics in Economic Theory</a>	1 SWS	Practice (Ü)	Pegorari

**Competence Certificate**

The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

**Prerequisites**

None

**Recommendation**

This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

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

## V

**Advanced Topics in Economic Theory**

2520527, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Die Veranstaltung wird in englischer Sprache angeboten:

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

T

**6.7 Course: Agile Product Innovation Management - Value-driven Planning of New Products [T-MACH-106744]****Responsible:** Dr.-Ing. Roland Kläger**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	3

**Competence Certificate**

Oral examination, 20 min.

**Prerequisites**

None

T

## 6.8 Course: Analysis of Social Structures (WiWi) [T-GEISTSOZ-109047]

**Responsible:** Prof. Dr. Gerd Nollmann

**Organisation:** KIT Department of Humanities and Social Sciences

**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	5011007	<a href="#">Analysis of Social Structures</a>	2 SWS	Practice (Ü)	Nollmann
Exams					
WS 19/20	7400029	<a href="#">Analysis of Social Structures (WiWi)</a>		Prüfung (PR)	Nollmann

T

## 6.9 Course: Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines [T-MACH-105173]

**Responsible:** Dr.-Ing. Marcus Gohl

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2134150	<a href="#">Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines</a>	2 SWS	Lecture (V)	Gohl
Exams					
WS 19/20	76-T-MACH-105173	<a href="#">Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines</a>		Prüfung (PR)	Koch
SS 2020	76--T-Mach-105173	<a href="#">Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines</a>		Prüfung (PR)	Gohl

### Competence Certificate

Letter of attendance or oral exam (25 minutes, no auxillary means)

### Prerequisites

none

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

V

### Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines

2134150, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Die Vorlesungsunterlagen werden vor jeder Veranstaltung an die Studenten verteilt.

## T

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

**Responsible:** Prof. Dr. Oliver Grothe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101420 - Econometrics and Economics](#)  
[M-WIWI-101608 - Statistics and Econometrics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
WS 19/20	2550550		2 SWS	Lecture (V)	Grothe
WS 19/20	2550551		2 SWS	Practice (Ü)	Grothe, N.N.
Exams					
WS 19/20	7900297	<a href="#">Analysis of Multivariate Data</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. The exam is offered every semester. Re-examinations are offered only for repeaters.

**Prerequisites**

None

**Recommendation**

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

**Annotation**

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

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

## V

2550550, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Literature**

Skript zur Vorlesung

T

## 6.11 Course: Analysis Tools for Combustion Diagnostics [T-MACH-105167]

**Responsible:** Jürgen Pfeil

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2134134	<a href="#">Analysis tools for combustion diagnostics</a>	2 SWS	Lecture (V)	Pfeil
Exams					
WS 19/20	76-T-MACH-105167	<a href="#">Analysis Tools for Combustion Diagnostics</a>		Prüfung (PR)	Koch
SS 2020	76-T-MACH-105167	<a href="#">Analysis Tools for Combustion Diagnostics</a>		Prüfung (PR)	Koch

### Competence Certificate

oral examination, Duration: 25 min., no auxiliary means

### Prerequisites

none

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

V

### Analysis tools for combustion diagnostics

2134134, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Skript, erhältlich in der Vorlesung

T

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

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
WS 19/20	2511314	<a href="#">Applications of Artificial Intelligence</a>	2 SWS	Lecture (V)	Sure-Vetter
WS 19/20	2511315	<a href="#">Exercises to Applied Informatics – Applications of Artificial Intelligence</a>	1 SWS	Practice (Ü)	Sure-Vetter, Weller
Exams					
WS 19/20	7900091	<a href="#">Applied Informatics - Applications of Artificial Intelligence</a>		Prüfung (PR)	Sure-Vetter
SS 2020	7900009	<a href="#">Applied Informatics - Applications of AI (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

### Competence Certificate

Written Examination (60 min) according to §4, Abs. 2, 1 of the examination regulations or oral examination of 20 minutes according to §4, Abs. 2, 2 of the examination regulations. The exam takes place every semester and can be repeated at every regular examination date.

### Prerequisites

None.

### Recommendation

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

### Annotation

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

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

V

### Applications of Artificial Intelligence

2511314, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



**Content**

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

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

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

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

**Learning objectives:**

The students

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

**Workload:**

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

**Exercises to Applied Informatics – Applications of Artificial Intelligence**

2511315, WS 19/20, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

The exercises are oriented on the lecture applications of AI.

Multiple exercises are held that capture the topics, held in the lecture Applications of AI and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

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

**Learning objectives:**

The students

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

## T

## 6.13 Course: Applied Informatics – Database Systems [T-WIWI-110341]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
SS 2020	2511200	<a href="#">Applied Informatics - Database Systems</a>	2 SWS	Lecture (V)	Sommer
SS 2020	2511201	<a href="#">Übungen zu Angewandte Informatik - Datenbanksysteme</a>	1 SWS	Practice (Ü)	Sommer
Exams					
WS 19/20	7900006	<a href="#">Applied Informatics - Database Systems</a>		Prüfung (PR)	Oberweis
SS 2020	7900037	<a href="#">Applied Informatics - Database Systems (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis

**Competence Certificate**

The assessment consists of a written exam (60 minutes) in the first week after lecture period.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-102660 - Database Systems](#) must not have been started.

**Annotation**

Replaces from summer semester 2020 T-WIWI-102660 "Database Systems".

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

## V

**Applied Informatics - Database Systems**

2511200, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Database systems (DBS) play an important role in today's companies. Internal and external data is stored and processed in databases in every company. The proper management and organization of data helps to solve many problems, enables simultaneous queries from multiple users and is the organizational and operational base for the entire working procedures and processes of the company. The lecture leads in the area of the database theory, covers the basics of database languages and database systems, considers basic concepts of object-oriented and XML databases, conveys the principles of multi-user control of databases and physical data organization. In addition, it gives an overview of business problems often encountered in practice such as:

- Correctness of data (operational, semantic integrity)
- Restore of a consistent database state
- Synchronization of parallel transactions (phantom problem).

**Learning objectives:**

Students

- are familiar with the concepts and principles of data base models, languages and systems and their applications and explain it,
- design and model relational data bases on the basis of theoretical foundations,
- create queries for relational databases,
- know how to handle enhanced data base problems occurring in the enterprises.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- Schlageter, Stucky. Datenbanksysteme: Konzepte und Modelle. Teubner 1983.
- S. M. Lang, P. C. Lockemann. Datenbankeinsatz. Springer-Verlag 1995.
- Jim Gray, Andreas Reuter. Transaction Processing: Concepts and Techniques. Morgan Kaufmann 1993.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

**Übungen zu Angewandte Informatik - Datenbanksysteme**

2511201, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

Database systems (DBS) play an enormously important role in today's companies. The internal and external data is stored and processed in the database of the respective company. The correct management and organization of this data helps to solve numerous problems, enables simultaneous queries by several users and is the organizational and operational basis for the entire workflows and processes of the company.

The lecture introduces the field of database theory, covers the basics of database languages and database systems, teaches the principles of multi-user database control and physical data organization. In addition, it provides an overview of database problems often encountered in business practice, such as the correctness of data (operational, semantic integrity), the recovery of a consistent database state, and the synchronization of parallel transactions.

**Literature**

Schlageter / Stucky: Datenbanksysteme: Konzepte und Modelle, 2. Auflage, Teubner, Stuttgart, 1983 P. C. Lockemann / J. W. Schmidt (Hrsg.): Datenbank-Handbuch, Springer-Verlag, 1987 S. Cannan / G. Otten: SQL - The Standard Handbook, McGraw-Hill, 1993 Jim Gray / Andreas Reuter: Transaction Processing: Concepts and Techniques, Morgan Kaufmann, 1993 S. M. Lang / P. C. Lockemann: Datenbankeinsatz, Springer-Verlag, 1995 Ramez Elmasri / Shamkant B. Navathe: Fundamentals of Database Systems, Addison-Wesley, 1994 und 2000

## T

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

**Responsible:** Prof. Dr. Melanie Volkamer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
SS 2020	2511550	<a href="#">Applied Informatics - Information Security</a>	2 SWS	Lecture (V)	Volkamer
SS 2020	2511551	<a href="#">Exercise Applied Informatics - Information Security</a>	1 SWS	Practice (Ü)	Volkamer, Reinheimer
Exams					
WS 19/20	7900074	<a href="#">Applied Informatics - Information Security</a>		Prüfung (PR)	Volkamer
SS 2020	7900064	<a href="#">Applied Informatics - Information Security (Registration until 13 July 2020)</a>		Prüfung (PR)	Volkamer

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (30 min) following §4, Abs. 2, 2 of the examination regulation.

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

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-108387 - Information Security](#) must not have been started.

**Annotation**

Replaces from summer term 2020 [T-WIWI-108387 "Information Security"](#).

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

## V

**Applied Informatics - Information Security**

2511550, SS 2020, 2 SWS, [Open in study portal](#)

Lecture (V)

**Content**

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

**Learning objectives:**

## The student

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

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

**Literature**

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

**Exercise Applied Informatics - Information Security**

2511551, SS 2020, 1 SWS, [Open in study portal](#)

Practice (Ü)

**Content**

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

## T

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

**Responsible:** Prof. Dr. Andreas Oberweis  
Prof. Dr. York Sure-Vetter

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

**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
WS 19/20	2511030	<a href="#">Applied Informatics - Modelling</a>	2 SWS	Lecture (V)	Oberweis, Sure-Vetter, Schiefer
WS 19/20	2511031	<a href="#">Exercises to Applied Informatics - Modelling</a>	1 SWS	Practice (Ü)	Oberweis, Sure-Vetter, Schiefer, Käfer
Exams					
WS 19/20	7900003	<a href="#">Applied Informatics - Modelling</a>		Prüfung (PR)	Oberweis, Sure-Vetter
SS 2020	7900018	<a href="#">Applied Informatics - Modelling (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis, Sure-Vetter

**Competence Certificate**

The assessment consists of a written examination (60 min) in the first week after lecture period (according to Section 4 (2),1 of the examination regulation).

**Prerequisites**

None

**Annotation**

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

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

## V

**Applied Informatics - Modelling**

2511030, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

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

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

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

**Learning objectives:**

Students

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

**Workload:**

- Total effort: 120-150 hours
- Presence time: 45 hours
- Self study: 75-105 hours

**Literature**

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

**Weiterführende Literatur:**

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

**Exercises to Applied Informatics - Modelling**

2511031, WS 19/20, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

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

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

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

**Learning objectives:**

Students

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

**Literature**

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

**Weiterführende Literatur:**

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



T

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

**Responsible:** Prof. Dr. Ali Sunyaev  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
SS 2020	2511032	<a href="#">Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</a>	2 SWS	Lecture (V)	Sunyaev
SS 2020	2511033	<a href="#">Übungen zu Angewandte Informatik - Internet Computing</a>	1 SWS	Practice (Ü)	Sunyaev
Exams					
WS 19/20	7900004	<a href="#">Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</a>		Prüfung (PR)	Sunyaev
SS 2020	7900025	<a href="#">Applied Informatics - Internet Computing (Registration until 13 July 2020)</a>		Prüfung (PR)	Sunyaev

### Competence Certificate

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is recommended for the written exam, which is offered at the end of the winter semester and at the end of the summer semester.

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

### Prerequisites

None

### Annotation

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

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

V

## Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services

Lecture (V)

2511032, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Content**

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

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

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

**Learning objectives:**

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

**Recommendations:**

Knowledge of content of the module [WI1INFO].

**Workload:**

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

**Literature**

Wird in der Vorlesung bekannt gegeben

## T

## 6.17 Course: Applied Informatics – Software Engineering [T-WIWI-110343]

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)  
[M-WIWI-105112 - Applied Informatics](#)

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

Events					
SS 2020	2511206	<a href="#">Applied Informatics - Software Engineering</a>	2 SWS	Lecture (V)	Oberweis
SS 2020	2511207	<a href="#">Übungen zu Angewandte Informatik - Software Engineering</a>	1 SWS	Practice (Ü)	Oberweis, Fritsch
Exams					
WS 19/20	7900026	<a href="#">Applied Informatics - Software Engineering</a>		Prüfung (PR)	Oberweis
SS 2020	7900027	<a href="#">Applied Informatics - Software Engineering (Registration until 13 July 2020)</a>		Prüfung (PR)	Oberweis

**Competence Certificate**

The assessment consists of an 1h written exam in the first week after lecture period.

**Modeled Conditions**

The following conditions have to be fulfilled:

1. The course [T-WIWI-100809 - Software Engineering](#) must not have been started.

**Annotation**

Replaces T-WIWI-100809 "Software Engineering" as of summer semester 2020.

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

## V

**Applied Informatics - Software Engineering**

2511206, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course deals with fundamental aspects of the systematic development of huge software systems. The course covers topics such as:

- software developing process models
- methods and tools for the development phases: requirements analysis, system specification, system design, programming and testing.

**Learning objectives:**

Students

- are familiar with the concepts and principles of software engineering and can discuss it,
- know common software development process models and their strengths and weaknesses and can discuss it,
- know methods for requirements analysis and can use it and can model and evaluate use case models,
- know models for systems structuring and controlling as well as architecture principles of software systems and can discuss it.
- can model and evaluate component diagrams
- are familiar with basic concepts of software quality management and are able to apply software test and evaluation methods in concrete situations.

**Workload:**

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

**Literature**

- H. Balzert. Lehrbuch der Software-Technik. Spektrum Verlag 2008.
- I. Sommerville. Software Engineering. Pearson Studium 2012.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T

## 6.18 Course: Auction &amp; Mechanism Design [T-WIWI-102876]

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

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

Events					
SS 2020	2560550	<a href="#">Auction and Mechanism Design</a>	2 SWS	Lecture (V)	Szech
SS 2020	2560551	<a href="#">Übung zu Auction and Mechanism Design</a>	1 SWS	Practice (Ü)	Szech, Huber

**Competence Certificate**

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

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

**Prerequisites**

None

**Recommendation**

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

**Annotation**

The lecture will be held in English.

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

V

**Auction and Mechanism Design**

2560550, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

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

The students

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

The lecture will be held in English.

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.

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

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

**Recommendations:**

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

**Literature**

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

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

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

T

**6.19 Course: Bachelor Thesis [T-WIWI-103096]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101612 - Module Bachelor Thesis](#)

Type	Credits	Version
Final Thesis	12	1

**Competence Certificate**

See module description

**Prerequisites**

See module description

**Final Thesis**

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

<b>Submission deadline</b>	6 months
<b>Maximum extension period</b>	1 months
<b>Correction period</b>	6 weeks

**Recommendation**

See module description

**Annotation**

See module description

## T

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

**Responsible:** Prof. Dr. Ingrid Ott  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101668 - Economic Policy I](#)

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

Events					
SS 2020	2560280	<a href="#">Basic Principles of Economic Policy</a>	2 SWS	Lecture (V)	Ott
SS 2020	2560281	<a href="#">Exercises of Basic Principles of Economic Policy</a>	1 SWS	Practice (Ü)	Ott, Scheu, Bälz

**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.

**Prerequisites**

None

**Recommendation**

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

**Annotation****Description:**

Theory of general economic policy and discussion of current economic policy topics:

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

**Learning objectives:**

Students learn:

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

**Learning content:**

- Market interventions: microeconomic perspective
- Market interventions: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Economic policy makers: Political-economic aspects

**Workload:**

- Total effort at 4.5 LP: approx. 135 hours
- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

**Media:**

See course announcement

**References:**

See course announcement



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



### Basic Principles of Economic Policy

2560280, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

#### Content

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

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

#### Learning objectives:

Students shall be given the ability to

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

#### Recommendations:

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

#### Workload:

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

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

#### Assessment:

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

#### Literature

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



### Exercises of Basic Principles of Economic Policy

2560281, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

#### Literature

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

T

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

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

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

**Part of:** [M-WIWI-101403 - Public Finance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

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

Events					
WS 19/20	2560134	<a href="#">Basics of German Company Tax Law and Tax Planning</a>	3 SWS	Lecture (V)	Wigger, Gutekunst

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course "Öffentliche Einnahmen" beforehand.

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

V

**Basics of German Company Tax Law and Tax Planning**

2560134, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Workload:**

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

## T

## 6.22 Course: Basics of Technical Logistics I [T-MACH-109919]

**Responsible:** Dr.-Ing. Martin Mittwollen  
Jan Oellerich

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101279 - Technical Logistics](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	1

Events					
WS 19/20	2117095	<a href="#">Basics of Technical Logistics</a>	3 SWS	Lecture / Practice (VÜ)	Mittwollen, Oellerich
Exams					
WS 19/20	76-T-MACH-109919	<a href="#">Basics of Technical Logistics I</a>		Prüfung (PR)	Mittwollen

**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**

Knowledge of the basics of technical mechanics preconditioned.

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

## V

**Basics of Technical Logistics**

2117095, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

- effect model of conveyor machines
- elements for the change of position and orientation
- conveyor processes
- identification systems
- drives
- mechanical behaviour of conveyors
- structure and function of conveyor machines
- elements of intralogistics
- sample applications and calculations in addition to the lectures inside practical lectures

Students are able to:

- Describe processes and machines of technical logistics,
- Model the fundamental structures and the impacts of material handling machines with mathematical models,
- Refer to industrially used machines
- Model real machines applying knowledge from lessons and calculate their dimensions.

**Literature**

Empfehlungen in der Vorlesung / Recommendations during lessons

## T

## 6.23 Course: Basics of Technical Logistics II [T-MACH-109920]

**Responsible:** Maximilian Hochstein

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101279 - Technical Logistics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2100001	<a href="#">Basics of Technical Logistics II</a>	3 SWS	Lecture / Practice (VÜ)	Hochstein
Exams					
WS 19/20	76-T-MACH-109920	<a href="#">Basics of Technical Logistics II</a>		Prüfung (PR)	Mittwollen

#### 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

Knowledge of the basics of technical mechanics and out of "Basic of Technical Logistics I" (T-MACH-109919) preconditioned.

T

## 6.24 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II [T-MACH-100967]

**Responsible:** Prof. Dr. Andreas Guber

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2142883	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</a>	2 SWS	Lecture (V)	Guber
Exams					
WS 19/20	76-T-MACH-100967	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II</a>		Prüfung (PR)	Guber

### Competence Certificate

Written exam (75 Min.)

### Prerequisites

none

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

V

## BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II

2142883, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:

LabCD, Protein Crystallisation

Microarrays

Tissue Engineering

Cell Chip Systems

Drug Delivery Systems

Micro reaction technology

Microfluidic Cells for FTIR-Spectroscopy

Microsystem Technology for Anesthesia, Intensive Care and Infusion

Analysis Systems of Person's Breath

Neurobionics and Neuroprosthesis

Nano Surgery

### Literature

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;

Springer-Verlag, 1994

M. Madou

Fundamentals of Microfabrication

T

## 6.25 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III [T-MACH-100968]

**Responsible:** Prof. Dr. Andreas Guber

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2142879	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</a>	2 SWS	Lecture (V)	Guber
Exams					
WS 19/20	76-T-MACH-100968	<a href="#">BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III</a>		Prüfung (PR)	Guber

### Competence Certificate

Written exam (75 Min.)

### Prerequisites

none

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

V

## BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III

Lecture (V)

2142879, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

### Content

Examples of use in minimally invasive therapy  
 Minimally invasive surgery (MIS)  
 Endoscopic neurosurgery  
 Interventional cardiology  
 NOTES  
 OP-robots and Endosystems  
 License of Medical Products and Quality Management

### Literature

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;  
 Springer-Verlag, 1994

M. Madou  
 Fundamentals of Microfabrication

T

**6.26 Course: Bionics for Engineers and Natural Scientists [T-MACH-102172]****Responsible:** PD Dr. Hendrik Hölscher**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	2142140	<a href="#">Bionics for Engineers and Natural Scientists</a>	2 SWS	Lecture (V)	Hölscher, Greiner
Exams					
WS 19/20	76-T-MACH-102172	<a href="#">Bionics for Engineers and Natural Scientists</a>	Prüfung (PR)		Hölscher

**Competence Certificate**

written or oral exam

**Prerequisites**

none

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

V

**Bionics for Engineers and Natural Scientists**2142140, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)****Content**

Bionics focuses on the design of technical products following the example of nature. For this purpose we have to learn from nature and to understand its basic design rules. Therefore, the lecture focuses on the analysis of the fascinating effects used by many plants and animals. Possible implementations into technical products are discussed in the end.

The students should be able analyze, judge, plan and develop biomimetic strategies and products.

Basic knowledge in physics and chemistry

lectures 30 h

self study 30 h

preparation for examination 30 h

The successful attendance of the lecture is controlled by a written examination.

**Literature**

Werner Nachtigall: Bionik – Grundlagen und Beispiele für Ingenieure und Naturwissenschaftler. Springer-Verlag Berlin (2002), 2. Aufl.

## T

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

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

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

**Part of:** [M-WIWI-101494 - Fundamentals of Business Administration 1](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	1

Events					
WS 19/20	2610026	<a href="#">Business Administration: Finance and Accounting</a>	2 SWS	Lecture (V)	Ruckes, Wouters
WS 19/20	2610027		2 SWS	Tutorial (Tu)	Strych
WS 19/20	2610029		2 SWS	Tutorial (Tu)	Strych
Exams					
WS 19/20	7900305	<a href="#">Business Administration: Finance and Accounting</a>		Prüfung (PR)	Ruckes, Wouters

**Competence Certificate**

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation.  
 The assessment takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

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

## V

**Business Administration: Finance and Accounting**

2610026, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

Ausführliche Literaturhinweise werden in den Materialien zur Vorlesung gegeben.



T

## 6.28 Course: Business Administration: Production Economics and Marketing [T-WIWI-102818]

**Responsible:** Prof. Dr. Wolf Fichtner  
 Prof. Dr. Martin Klarmann  
 Prof. Dr.-Ing. Thomas Lützkendorf  
 Prof. Dr. Martin Ruckes  
 Prof. Dr. Frank Schultmann

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

**Part of:** [M-WIWI-101578 - Fundamentals of Business Administration 2](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2020	2500025	<a href="#">Tutorien zu BWL PM</a>	2 SWS	Tutorial (Tu)	Klarmann, Strych, Assistenten
SS 2020	2600024	<a href="#">Business Administration: Production Economics and Marketing</a>	2 SWS	Lecture (V)	Klarmann, Schultmann
Exams					
WS 19/20	7900246	<a href="#">Business Administration: Production Economics and Marketing</a>		Prüfung (PR)	Klarmann, Schultmann

### Competence Certificate

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

### Prerequisites

None

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

V

### Business Administration: Production Economics and Marketing

2600024, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course is composed of the sub-areas:

**1. Marketing:**

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

Topics dealt with in detail:

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

**2. Production Economy:**

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

Topics dealt with in detail:

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

**3. Information Systems:**

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

Examples from practice motivate and complement the topics.

Treated topics in detail:

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

**Literature**

Ausführliche Literaturhinweise werden gegeben in den Materialien zur Vorlesung.

T

## 6.29 Course: Business Administration: Strategic Management and Information Engineering and Management [T-WIWI-102817]

**Responsible:** Prof. Dr. Petra Nieken  
Prof. Dr. Martin Ruckes

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

**Part of:** [M-WIWI-101494 - Fundamentals of Business Administration 1](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2600023	Betriebswirtschaftslehre: Unternehmensführung und Informationswirtschaft	2 SWS	Lecture (V)	Weinhardt, Strych, Nieken
Exams					
WS 19/20	7900306	Business Administration: Strategic Management and Information Engineering and Management		Prüfung (PR)	Weinhardt, Nieken

### Competence Certificate

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation. The assessment takes place in every semester. Re-examinations are offered at every ordinary examination date.

### Prerequisites

None

T

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

**Responsible:** Prof. Dr. Wolfgang Müller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2530299	<a href="#">Business Strategies of Banks</a>	2 SWS	Lecture (V)	Müller
Exams					
WS 19/20	7900064	<a href="#">Business Strategies of Banks</a>		Prüfung (PR)	Müller, Ruckes

**Competence Certificate**  
See German version.

**Prerequisites**  
None

**Recommendation**  
None

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

V

**Business Strategies of Banks**2530299, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

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

**T 6.31 Course: CAD-NX Training Course [T-MACH-102187]**

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

<b>Type</b> Completed coursework (practical)	<b>Credits</b> 2	<b>Recurrence</b> Each term	<b>Version</b> 2
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Events					
WS 19/20	2123357	<a href="#">CAD-NX training course</a>	2 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
SS 2020	2123357	<a href="#">CAD-NX training course</a>	2 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
Exams					
WS 19/20	76-T-MACH-102187	<a href="#">CAD-NX Training Course</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**  
 Practical examination on CAD computer, duration: 60 min.

**Prerequisites**  
 None

**Recommendation**  
 Dealing with technical drawings is required.

**Annotation**  
 For the practical course compulsory attendance exists.

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

**V CAD-NX training course** **Practical course (P)**  
 2123357, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Content**

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

**Literature**  
 Praktikumsskript

**CAD-NX training course**2123357, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)****Content**

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

**Literature**

Praktikumsskript

T

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

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101190 - Introduction to Civil Law](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	3

Events					
WS 19/20	24012	<a href="#">Civil Law for Beginners</a>	4 SWS	Lecture (V)	Matz
Exams					
WS 19/20	7500012	<a href="#">Civil Law for Beginners</a>		Prüfung (PR)	Matz, Dreier
SS 2020	7500041	<a href="#">Civil Law for Beginners</a>		Prüfung (PR)	Dreier, Matz

T

**6.33 Course: Climatology [T-PHYS-101092]**

**Responsible:** Prof. Dr. Joaquim José Ginete Werner Pinto  
Katharina Maurer

**Organisation:** KIT Department of Physics

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Completed coursework	5	Each summer term	3

Events					
SS 2020	4051111	<a href="#">Klimatologie</a>	3 SWS	Lecture (V)	Ginete Werner Pinto
SS 2020	4051112	<a href="#">Übungen zu Klimatologie</a>	1 SWS	Practice (Ü)	Ginete Werner Pinto, Ludwig, Mömken

**Prerequisites**

none



T

**6.34 Course: Combustion Engines I [T-MACH-102194]**

**Responsible:** Prof. Dr. Thomas Koch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101275 - Combustion Engines I](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each winter term	1

Events					
WS 19/20	2133113	<a href="#">Combustion Engines I</a>	4 SWS	Lecture / Practice (VÜ)	Koch
Exams					
WS 19/20	76-T-MACH-102194	<a href="#">Combustion Engines I</a>		Prüfung (PR)	Kubach, Koch
SS 2020	76-T-MACH-102194	<a href="#">Combustion Engines I</a>		Prüfung (PR)	Koch, Kubach

**Competence Certificate**

oral examination, Duration: 25 min., no auxiliary means

**Prerequisites**

none

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

V

**Combustion Engines I**2133113, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

Introduction, History, Concepts  
Working Principle and Applications  
Characteristic Parameters  
Engine Parts  
Drive Train  
Fuels  
Gasoline Engines  
Diesel Engines  
Exhaust Gas Aftertreatment

T

**6.35 Course: Combustion Engines II [T-MACH-104609]**

**Responsible:** Dr.-Ing. Rainer Koch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	5	Each summer term	1

Events					
SS 2020	2134151	<a href="#">Combustion Engines II</a>	3 SWS	Lecture / Practice (VÜ)	Koch
Exams					
WS 19/20	76-T-MACH-104609	<a href="#">Combustion Engines II</a>		Prüfung (PR)	Kubach, Koch
SS 2020	76-T-MACH-104609	<a href="#">Combustion Engines II</a>		Prüfung (PR)	Koch, Kubach

**Competence Certificate**

oral examination, duration: 25 minutes, no auxiliary means

**Prerequisites**

none

**Recommendation**

Fundamentals of Combustion Engines I helpful

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

V

**Combustion Engines II**2134151, SS 2020, 3 SWS, Language: German, [Open in study portal](#)**Lecture / Practice (VÜ)**

T

## 6.36 Course: Competition in Networks [T-WIWI-100005]

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

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2561204	<a href="#">Competition in Networks</a>	2 SWS	Lecture (V)	Mitusch
WS 19/20	2561205	<a href="#">Übung zu Wettbewerb in Netzen</a>	1 SWS	Practice (Ü)	Wisotzky, Mitusch, Corbo
Exams					
WS 19/20	7900292	<a href="#">Competition in Networks</a>		Prüfung (PR)	Mitusch

**Competence Certificate**

Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

**Prerequisites**

None.

**Recommendation**

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

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

V

**Competition in Networks**

2561204, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.

## T

## 6.37 Course: Computer Contract Law [T-INFO-102036]

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

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2411604	<a href="#">Computer Contract Law</a>	2 SWS	Lecture (V)	Bartsch
Exams					
WS 19/20	7500065	<a href="#">Computer Contract Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500066	<a href="#">Computer Contract Law</a>		Prüfung (PR)	Dreier, Matz

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

## V

## Computer Contract Law

2411604, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

## Content

The course deals with contracts from the following areas:

- Contracts of programming, licencing and maintaining software
- Contracts in the field of IT employment law
- IT projects and IT Outsourcing
- Internet Contracts

From these areas single contracts will be chosen and discussed (e.g. software maintenance, employment contract with a software engineer). Concerning the respective contract the technical features, the economic background and the subsumption in the national law of obligation (BGB-Schuldrecht) will be discussed. As a result different contractual clauses will be developed by the students. Afterwards typical contracts and conditions will be analysed with regard to their legitimacy as standard business terms (AGB). It is the aim to show the effects of the german law of standard business terms (AGB-Recht) and to point out that contracts are a means of drafting business concepts and market appearance.

It is the aim of this course to provide students with knowledge in the area of contract formation and formulation in practice that builds upon the knowledge the students have already acquired concerning the legal protection of computer programs. Students shall understand how the legal rules depend upon, and interact with, the economic background and the technical features of the subject. The contract drafts shall be prepared by the students and will be corporately completed during the lecture. It is the aim of the course that students will be able to formulate contracts by themselves.

## Literature

- Langenfeld, Gerrit Vertragsgestaltung Verlag C.H.Beck, III. Aufl. 2004
- Heussen, Benno Handbuch Vertragsverhandlung und Vertragsmanagement Verlag C.H.Beck, II. Aufl. 2002
- Schneider, Jochen Handbuch des EDV-Rechts Verlag Dr. Otto Schmidt KG, III. Aufl. 2002

## Weiterführende Literatur

Ergänzende Literatur wird in den Vorlesungsfolien angegeben.

T

## 6.38 Course: Construction Technology [T-BGU-101691]

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [M-BGU-101004 - Fundamentals of Construction](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	6200410	<a href="#">Construction Technology</a>	3 SWS	Lecture (V)	Gentes, Haghsheno, Schneider
SS 2020	6200411	<a href="#">Exercises to Construction Technology</a>	1 SWS	Practice (Ü)	Gentes, Haghsheno, Schneider, Waleczko
Exams					
WS 19/20	8230101691	<a href="#">Construction Technology</a>		Prüfung (PR)	Haghsheno, Gentes, Schneider

**Competence Certificate**

written exam with 90 minutes

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T

**6.39 Course: Consumer Behavior [T-WIWI-106569]**

**Responsible:** Benjamin Scheibehenne  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Once	2

Events					
SS 2020	2572174	<a href="#">Consumer Behavior</a>	3 SWS	Lecture (V)	Scheibehenne
SS 2020	2572175	<a href="#">Introduction to Bayesian Statistics for Analyzing Data</a>	2 SWS	Lecture (V)	Scheibehenne

**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 the research group Marketing and Sales (<http://marketing.iism.kit.edu/>).

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

V

**Consumer Behavior**

2572174, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Goal**

The goal of the class is to gain a better understanding of the situational, biological, cognitive, and evolutionary factors that drive consumer behavior. We will address these questions from an interdisciplinary perspective, including relevant theories and empirical research findings from Psychology, Marketing, Cognitive Science, Biology, and Economics.

**Description**

Consumer decisions are ubiquitous in daily life and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. To help people making better choices it is important to understand the factors that influence their behavior. Towards this goal, we will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates.

The lecture will be held in English.

**Grading**

There will be a written exam at the last day of class. The exam will cover the content of the lecture and the literature listed in the required reading list that will be made available to enrolled students on the first day of class. The exam questions will be in English. You are allowed to bring a language dictionary into the exam but you are not allowed to bring notes.

**Workload**

The total workload for this course is approximately 135 hours.

Presence time: 30 hours

Preparation and wrap-up of the course: 45 hours

Exam and exam preparation: 60 hours

**Comment**

This lecture features a “double down” format: There will be two lecture sessions in a row during the first half of the semester. Thus, you will be finished with this class after 7 weeks.

**Literature**

Will be made available to enrolled students on the first day of class.

**Introduction to Bayesian Statistics for Analyzing Data**

2572175, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**Content****Goal**

The goal of this class is to introduce Bayesian statistics as a viable alternative to conventional Null-Hypothesis significance testing (NHST) and the calculation of p-values. The class introduces the theoretical background of Bayesian statistics and its advantages over NHST. Based on this, students will work through hands-on approaches for analyzing various empirical data using Bayesian statistics. These analyses will mainly be conducted with the statistics software R and JASP. The class provides participants with the necessary skills to evaluate and interpret the results of published Bayesian analyses and to use the method for testing hypotheses and estimating model parameters based on empirical data. There will be regular reading and homework assignments.

**Requirements**

Participants should already have a basic knowledge of R and standard frequentist statistical tests. Please bring your own Laptop with you as we will be using R for several hands-on examples and exercises during the class. We will mainly work with the book "Statistical Rethinking. A Bayesian Course with Examples in R and Stan" by Richard McElrath. Students are advised to obtain the book before the class starts.

**Schedule**

The class will consist of three day-long sessions from 9:00 (s.t.) to 18:00. The first session will be held on Thursday, the 7th of May 2020. The second session will be on Thursday, the 28th of May. The third session will be on Thursday, the 18th of June. The classroom will be communicated to registered students in advance. In case classrooms will be closed due to the Corona virus, the class will be taught online and the schedule will be adapted.

**Grading**

Grades will be based on active participation (50%) and homework assignments (50%).

**Registration and number of participants**

Due to its interactive nature, participation will be limited to 10 students. If you want to participate, please send a short email to [scheibehenne@kit.edu](mailto:scheibehenne@kit.edu) until Thursday, the 23rd of April in which you outline why you are interested in this class and what your expectations are.

**Literature**

McElrath, R. (2016). Statistical Rethinking. A Bayesian Course with Examples in R and Stan. Taylor & Francis Group. (main literature)

Kruschke, J. (2014). Doing Bayesian Data Analysis: A Tutorial Introduction with R. Academic Press. (additional literature)



T

**6.40 Course: Control Technology [T-MACH-105185]****Responsible:** Christoph Gönzheimer**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	2

Events					
SS 2020	2150683	<a href="#">Control Technology</a>	2 SWS	Lecture (V)	Gönzheimer
Exams					
WS 19/20	76-T-MACH-105185	<a href="#">Control Technology</a>		Prüfung (PR)	Gönzheimer

**Competence Certificate**

Written Exam (60 min)

**Prerequisites**

none

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

V

**Control Technology**2150683, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**

**Content**

The lecture control technology gives an integral overview of available control components within the field of industrial production systems.

The first part of the lecture deals with the fundamentals of signal processing and with control peripherals in the form of sensors and actors which are used in production systems for the detection and manipulation of process states.

The second part handles with the function of electric control systems in the production environment. The main focus in this chapter is laid on programmable logic controls, computerized numerical controls and robot controls. Finally the course ends with the topic of cross-linking and decentralization with the help of bus systems.

The lecture is very practice-oriented and illustrated with numerous examples from different branches.

The following topics will be covered:

- Signal processing
- Control peripherals
- Programmable logic controls
- Numerical controls
- Controls for industrial robots
- Distributed control systems
- Field bus
- Trends in the area of control technology

**Learning Outcomes:**

The students ...

- are able to name the electrical controls which occur in the industrial environment and explain their function.
- can explain fundamental methods of signal processing. This involves in particular several coding methods, error protection methods and analog to digital conversion.
- are able to choose and to dimension control components, including sensors and actors, for an industrial application, particularly in the field of plant engineering and machine tools. Thereby, they can consider both, technical and economical issues.
- can describe the approach for projecting and writing software programs for a programmable logic control named Simatic S7 from Siemens. Thereby they can name several programming languages of the IEC 1131.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in ilias (<https://ilias.studium.kit.edu/>).

## T

## 6.41 Course: Conveying Technology and Logistics [T-MACH-102135]

**Responsible:** Prof. Dr.-Ing. Kai Furmans  
Paolo Pagani

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>	SWS	Seminar (S)	Furmans, Pagani
SS 2020	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>	SWS	Seminar (S)	Furmans, Pagani
Exams					
WS 19/20	76-T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>		Prüfung (PR)	Furmans
SS 2020	76-T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>		Prüfung (PR)	Furmans

**Competence Certificate**

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

**Prerequisites**

none

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

## V

**Fördertechnik und Logistiksysteme**

2119100, SS 2020, SWS, [Open in study portal](#)

**Seminar (S)**

**Content**

The goal of the seminar is to deal with different topics related to the materials handling and logistics. The students can work on the topic either alone or in a group work. At the end the results are presented and discussed with a final presentation. The prepare the work for the seminar an introductory event is scheduled at the beginning.

T

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

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

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24121	<a href="#">Copyright</a>	2 SWS	Lecture (V)	Dreier
Exams					
WS 19/20	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500064	<a href="#">Copyright</a>		Prüfung (PR)	Dreier, Matz

T

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

**Responsible:** Rheza Nakhaeizadeh  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101608 - Statistics and Econometrics](#)

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

Events					
SS 2020	2520375	<a href="#">Data Mining and Applications</a>	2/4 SWS	Lecture (V)	Nakhaeizadeh

**Competence Certificate**

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

**Prerequisites**

None

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

V

**Data Mining and Applications**2520375, SS 2020, 2/4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

Students

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

**Content:**

Part one: Data Mining:

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

Part two: Examples of application of Data Mining

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

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Exam preparation: 40 hours

**Literature**

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

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

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

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

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

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

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

T

## 6.44 Course: Data Protection Law [T-INFO-101303]

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24018	<a href="#">Datenschutzrecht</a>	2 SWS	Lecture (V)	Barczak
Exams					
WS 19/20	7500162	<a href="#">Data Protection Law</a>		Prüfung (PR)	Barczak
SS 2020	7500083	<a href="#">Data Protection Law</a>		Prüfung (PR)	Eichenhofer

T

**6.45 Course: Decision Theory [T-WIWI-102792]**

**Responsible:** Prof. Dr. Karl-Martin Ehrhart  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101420 - Econometrics and Economics](#)  
[M-WIWI-101499 - Applied Microeconomics](#)

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

Exams			
WS 19/20	7900291	<a href="#">Decision 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

**Recommendation**

Knowledge in mathematics and statistics is required.



## T

## 6.46 Course: Derivatives [T-WIWI-102643]

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

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

Events					
SS 2020	2530550	<a href="#">Derivatives</a>	2 SWS	Lecture (V)	Uhrig-Homburg, Thimme
SS 2020	2530551	<a href="#">Übung zu Derivate</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Eska
Exams					
WS 19/20	7900051	<a href="#">Derivatives</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment takes place in the form of a written examination (75 minutes) according to §4(2), 1 SPO. The examination takes place during the semester break. The examination is offered every semester and can be repeated at any regular examination date. A bonus can be acquired through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

**Prerequisites**

None

**Recommendation**

None

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

## V

**Derivatives**2530550, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

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

**Weiterführende Literatur:**

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

T

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

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf

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

**Part of:** [M-WIWI-101467 - Design, Construction and Sustainability Assessment of Buildings](#)

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

Events					
WS 19/20	2586404	<a href="#">Design and Construction of Buildings</a>	2 SWS	Lecture (V)	Lützkendorf
WS 19/20	2586405	<a href="#">Übung zu Bauökologie I</a>	1 SWS	Practice (Ü)	Worschech, Jungmann
Exams					
WS 19/20	7900247	<a href="#">Design, Construction and Sustainability Assessment of Buildings I</a>		Prüfung (PR)	Lützkendorf
WS 19/20	7900248	<a href="#">Design, Construction and Sustainability Assessment of Buildings I</a>		Prüfung (PR)	Lützkendorf

### Competence Certificate

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

### Prerequisites

None

### Recommendation

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

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

V

### Design and Construction of Buildings

2586404, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

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

**Recommendations:**

A combination with the module *Real Estate Management* [WW3BWL01] and with engineering science modules in the area of building physics and structural design is recommended.

The student

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

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

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

**Literature****Weiterführende Literatur:**

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

T

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

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

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

Events					
SS 2020	2585403	<a href="#">Übung zu Bauökologie II</a>	1 SWS	Practice (Ü)	Jungmann
SS 2020	2585404	<a href="#">Sustainability Assessment of Buildings</a>	2 SWS	Lecture (V)	Lützkendorf

### Competence Certificate

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

### Prerequisites

None

### Recommendation

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

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

V

## Sustainability Assessment of Buildings

2585404, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

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

### Recommendations:

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

The student

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

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

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

**Literature****Weiterführende Literatur:**

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

## T

**6.49 Course: Digital Services [T-WIWI-109938]**

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

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

**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)  
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)  
[M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

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

Events					
SS 2020	2595466	<a href="#">Digital Services</a>	2 SWS	Lecture (V)	Satzger, Weinhardt, Kühl
SS 2020	2595467	<a href="#">Exercise Digital Services</a>	1 SWS	Practice (Ü)	Kühl, Schöffer, Badewitz
Exams					
WS 19/20	7900232	<a href="#">Digital Services</a>		Prüfung (PR)	Satzger

**Competence Certificate**

The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations). By successful completion of the exercises (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

**Prerequisites**

see below

**Annotation**

This course replaces T-WIWI-105771 "Foundations of Digital Services A" as of winter semester 2019/2020.

Students who wish to register for the examination in the summer semester 2019 please select the examination "Foundations of Digital Services A".

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

## V

**Digital Services**

2595466, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The world is moving more and more towards "service-led" economies: in developed countries services already account for around 70% of gross value added. In order to design, engineer, and manage services, traditional "goods-oriented" models are often inappropriate. In addition, the rapid development of information and communication technology (ICT) pushes the economic importance of services that are rendered electronically (eServices) and, thus, drives competitive changes: increased interaction and individualization open up new dimensions of "value co-creation" between providers and customers; dynamic and scalable service value networks replace static value chains; digital services can be globally delivered and exchanged across today's geographic boundaries. Building on a systematic categorization of (e)Services and on the general notion of "value co-creation", we cover concepts and foundations for engineering and managing IT-based services, allowing for further specialization in subsequent KSRI courses. Topics include service innovation, service economics, service modeling as well as the transformation and coordination of service value networks. In addition, case studies, hands-on exercises and guest lectures will illustrate the applicability of the concepts. English language is used throughout the course to acquaint students with international environments.

**Literature**

- Anderson, J./Nirmalya, K. / Narus, J. (2007), Value Merchants.
- Lovelock, C. / Wirtz, J. (2007) Services Marketing, 6th ed.
- Meffert, H./Bruhn, M. (2006), Dienstleistungsmarketing, 5. Auflage,
- Spohrer, J. et al. (2007), Steps towards a science of service systems. In: IEEE Computer, 40 (1), p. 70-77
- Stauss, B. et al. (Hrsg.) (2007), Service Science – Fundamentals Challenges and Future Developments.
- Teboul, (2007), Services is Front Stage.
- Vargo, S./Lusch, R. (2004) Evolving to a New Dominant Logic for Marketing, in: Journal of Marketing 68(1): 1-17.
- Shapiro, C. / Varian, H. (1998), Information Rules - A Strategic Guide to the Network Economy

T

## 6.50 Course: Digitalization from Production to the Customer in the Optical Industry [T-MACH-110176]

**Responsible:** Marc Wawerla

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

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

Events					
WS 19/20	2149701	<a href="#">Digitalization from Production to the Customer in the Optical Industry</a>	2 SWS	Lecture (V)	Wawerla
Exams					
WS 19/20	76-T-MACH-110176	<a href="#">Digitalization from Production to the Customer in the Optical Industry</a>		Prüfung (PR)	Wawerla

### Competence Certificate

Alternative test achievement (graded):

- Processing and presentation (ca. 15 min) of a case study with weighting 20%
- Oral exam (ca. 20 min) with weighting 80%

### Prerequisites

none

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

V

## Digitalization from Production to the Customer in the Optical Industry

2149701, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

The lecture deals with Digitalization along the entire value chain end-to-end, with a focus on production and supply chain. Within this context, concepts, tools, methods, technologies and concrete applications in the industry are presented. Furthermore, the students get the opportunity to get first-hand insights into the digitalization journey of a German technology company.

Main topics of the lecture:

- Concepts and methods such as disruptive innovation and agile project management
- Overview on technologies at disposal
- Practical approaches in innovation
- Applications in industry
- Field trip to ZEISS

### Learning Outcomes:

The students ...

- are capable to comment on the content covered by the lecture.
- are able to analyze and evaluate the suitability of digitalization technologies in the optical industry.
- are able to assess the applicability of methods such as disruptive innovation and agile project management.
- are able to appreciate the practical challenges to digitalization in industry.

### Workload:

regular attendance: 21 hours

self-study: 99 hours



T

## 6.51 Course: Economics and Behavior [T-WIWI-102892]

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

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

Events					
WS 19/20	2560137	<a href="#">Economics and Behavior</a>	2 SWS	Lecture (V)	Ehrlich, Puppe
WS 19/20	2560138	<a href="#">Übung zu Economics and Behavior</a>	1 SWS	Practice (Ü)	Ehrlich
Exams					
WS 19/20	7900134	<a href="#">Exam Economics and Behavior</a>		Prüfung (PR)	Puppe, Szech
WS 19/20	7900135	<a href="#">Exam Economics and Behavior (2)</a>		Prüfung (PR)	Szech, 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.

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

**Prerequisites**

None

**Recommendation**

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

**Annotation**

The lecture will be held in English.

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

V

**Economics and Behavior**

2560137, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers topics from behavioral economics with regard to contents and methods. In addition, the students gain insight into the design of economic experiments. Furthermore, the students will become acquainted with reading and critically evaluating current research papers in the field of behavioral economics.

The students

- gain insight into fundamental topics in behavioral economics;
- get to know different research methods in the field of behavioral economics;
- learn to critically evaluate experimental designs;
- get introduced to current research papers in behavioral economics;
- become acquainted with the technical terminology in English.

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

The grade will be determined in a final written exam. Students can earn a bonus to the final grade by successfully participating in the exercises.

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

The lecture will be held in English.

**Recommendations:**

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

**Literature**

Kahnemann, Daniel: Thinking, Fast and Slow. Farrar, Straus and Giroux, 2011.

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

Ariely, Dan: The Upside of Irrationality. New York: HarperCollins 2011.

T

**6.52 Course: Economics I: Microeconomics [T-WIWI-102708]**

**Responsible:** Prof. Dr. Clemens Puppe  
Prof. Dr. Johannes Philipp Reiß

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

**Part of:** [M-WIWI-101726 - Preliminary Exam](#)  
[M-WIWI-105204 - Economics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2610012	<a href="#">Economics I: Microeconomics</a>	3 SWS	Lecture (V)	Puppe
Exams					
WS 19/20	7900276	<a href="#">Economics I: Microeconomics</a>		Prüfung (PR)	Puppe
WS 19/20	7900277	<a href="#">Economics I: Microeconomics</a>		Prüfung (PR)	Puppe

**Competence Certificate**

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.

There may be offered a practice exam in the middle of the semester. The results of this exam may be used to improve the grade of the main exam. If the grade of the written exam is between 4.0 and 1.3, the bonus improves the grade by one grade (0.3 or 0.4). A detailed description of the examination modalities will be given by the respective lecturer.

The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. As a rule, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

**Prerequisites**

None

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

V

**Economics I: Microeconomics**

2610012, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

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

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

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

In particular, the student should learn

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

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

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

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation. The main exam takes place subsequent to the lecture.

The re-examination is offered at the same examination period. Usually, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

The total workload for this course is approximately 150 hours.

### Literature

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

T

**6.53 Course: Economics II: Macroeconomics [T-WIWI-102709]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105204 - Economics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2020	2600014	<a href="#">Economics II: Macroeconomics</a>	4 SWS	Lecture (V)	Scheffel
SS 2020	2660015	<a href="#">Economics II : Macroeconomics, Tutorial</a>	2 SWS	Tutorial (Tu)	Scheffel, Krause
Exams					
WS 19/20	790vwl2	<a href="#">Economics II: Macroeconomics</a>		Prüfung (PR)	Wigger

**Competence Certificate**

The assessment consists of a written exam (120 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

**Economics II: Macroeconomics**

2600014, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Content****Classical Theory of Macroeconomic Production**

Chapter 1: Gross domestic product

Chapter 2: Money and Inflation

Chapter 3: Open Economy I

Chapter 4: Unemployment

**Growth: The economy in the long term**

Chapter 5: Growth I

Chapter 6: Growth II

**Business cycle: The economy in the short term**

Chapter 7: Economy and aggregate demand I

Chapter 8: Economy and aggregate demand II

Chapter 9: Open Economy II

Chapter 10: Macroeconomic supply

**Advanced topics of macroeconomics**

Chapter 11: Dynamic model of the economy as a whole

Chapter 12: Microeconomic foundations

Chapter 13: Macroeconomic economic policy

**Learning goals:**

The students. . .

- can name the basic indicators, technical terms and concepts of macroeconomics.
- can use models to reduce complex relationships to their basic components.
- can analyse economic policy debates and form their own opinion on them.

**Workload:**

Total effort for 5 credit points: approx. 150 hours

Presence time: 45 hours

Before and after the LV: 67.5 hours

Exam and exam preparation: 37.5 hours

**Literature**

Als Grundlage dieser Veranstaltung dient das bekannte Lehrbuch „Makroökonomik“ von Greg Mankiw vom Schäffer Poeschel Verlag in der aktuellen Fassung.

T

**6.54 Course: Economics III: Introduction in Econometrics [T-WIWI-102736]**

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-105203 - Introduction in Econometrics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2020	2520016	<a href="#">Economics III: Introduction to Econometrics</a>	2 SWS	Lecture (V)	Schienle
SS 2020	2520017	<a href="#">Übungen zu VWL III</a>	2 SWS	Practice (Ü)	Schienle, Buse

**Competence Certificate**

The assessment consists of an 1h written exam according to Section 4(2), 1 of the examination regulation.

**Prerequisites**

None

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

V

**Economics III: Introduction to Econometrics**

2520016, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

- Familiarity with the basic concepts and methods of econometrics
- Preparation of simple econometric surveys

**Content:**

- Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)
- Model assessment

**Requirements:**

Knowledge of the lectures Statistics I + II is required.

**Workload:**

Total workload for 5 CP: approx. 150 hours

Attendance: 30 hours

Preparation and follow-up: 120 hours

**Literature**

Von Auer: Ökonometrie ISBN 3-540-00593-5

Goldberger: A course in Econometrics ISBN 0-674-17544-1

Gujarati. Basic Econometrics ISBN 0-07-113964-8

Schneeweiß: Ökonometrie ISBN 3-7908-0008-2

## T

## 6.55 Course: eFinance: Information Systems for Securities Trading [T-WIWI-110797]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-101465 - Topics in Finance I](#)  
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

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

Events					
WS 19/20	2540454	<a href="#">eFinance: Information Systems for Securities Trading</a>	2 SWS	Lecture (V)	Weinhardt, Notheisen
WS 19/20	2540455	<a href="#">Übungen zu eFinance: Wirtschaftsinformatik für den Wertpapierhandel</a>	1 SWS	Practice (Ü)	Jaquart, Soufi
Exams					
WS 19/20	7900182	<a href="#">eFinance: Information Engineering and Management for Securities Trading</a>		Prüfung (PR)	Weinhardt
WS 19/20	7900309	<a href="#">eFinance: Information Systems for Securities Trading</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

Success is monitored by means of ongoing elaborations and presentations of tasks and an examination (60 minutes) at the end of the lecture period. The scoring scheme for the overall evaluation will be announced at the beginning of the course.

**Prerequisites**

see below

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

## V

**eFinance: Information Systems for Securities Trading**

2540454, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

- Picot, Arnold, Christine Bortenlänger, Heiner Röhr (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners". Oxford University Press, New York

**Weiterführende Literatur:**

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ



T

**6.56 Course: Electric Energy Systems [T-ETIT-101923]**

**Responsible:** Prof. Dr.-Ing. Thomas Leibfried  
**Organisation:** KIT Department of Electrical Engineering and Information Technology  
**Part of:** [M-ETIT-102379 - Power Network](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2020	2307391	<a href="#">Electric Energy Systems</a>	2 SWS	Lecture (V)	Leibfried
SS 2020	2307393	<a href="#">Übungen zu 2307391 Elektroenergiesysteme</a>	1 SWS	Practice (Ü)	Steinle
Exams					
WS 19/20	7307391	<a href="#">Electric Energy Systems</a>		Prüfung (PR)	Leibfried

**Prerequisites**

none

T

**6.57 Course: Empirical Finance [T-WIWI-110216]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105035 - Empirical Finance](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	2500001	<a href="#">Empirical Finance</a>	4 SWS	Lecture (V)	Ulrich
Exams					
WS 19/20	7900008	<a href="#">Empirical Finance</a>		Prüfung (PR)	Ulrich

**Competence Certificate**

The assessment consists of a written exam (90 minutes) according to §4(2) of the examination regulation.

**Prerequisites**

None.

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

V

**Empirical Finance**

2500001, WS 19/20, 4 SWS, Language: English, [Open in study portal](#)

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

The aim of this course is to introduce the student to empirical data work in financial economics and investments. Students will learn and implement modern portfolio theory and the most important concepts to estimate expected returns and volatility.

The course covers several topics, among them:

Mean-Variance Portfolio Optimization

Modeling Distribution of Asset Returns: Factor Models, ARMA-GARCH

Monte-Carlo Simulation

Parameter Estimation with Maximum Likelihood and Regressions

At the core of this lecture is the work on modern portfolio theory of Markowitz. Students will learn how to allocate investment opportunities to an optimal portfolio under investment constraints. To obtain the necessary inputs to this framework, students will revisit statistical concepts such as linear regression and maximum likelihood estimation to estimate expected returns and volatilities with econometric time series models.

The total workload for this course is approximately 180 hours.

T

## 6.58 Course: Employment Law I [T-INFO-101329]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24167	<a href="#">Employment Law I</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500040	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500097	<a href="#">Employment Law I</a>		Prüfung (PR)	Dreier, Matz

T

**6.59 Course: Employment Law II [T-INFO-101330]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2020	24668	<a href="#">Employment Law II</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500058	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500098	<a href="#">Employment Law II</a>		Prüfung (PR)	Dreier, Matz

T

## 6.60 Course: Energy Conversion and Increased Efficiency in Internal Combustion Engines [T-MACH-105564]

**Responsible:** Prof. Dr. Thomas Koch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101275 - Combustion Engines I](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	2133121	<a href="#">Energy Conversion and Increased Efficiency in Internal Combustion Engines</a>	2 SWS	Lecture (V)	Koch
Exams					
WS 19/20	76-T-MACH-105564	<a href="#">Energy Conversion and Increased Efficiency in Internal Combustion Engines</a>		Prüfung (PR)	Koch
SS 2020	76-T-MACH-105564	<a href="#">Energy Conversion and Increased Efficiency in Internal Combustion Engines</a>		Prüfung (PR)	Koch, Kubach

### Competence Certificate

oral exam, 25 minutes, no auxiliary means

### Prerequisites

none

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

V

## Energy Conversion and Increased Efficiency in Internal Combustion Engines

Lecture (V)

2133121, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

### Content

1. Introduction
2. Thermodynamics of combustion engines
3. Fundamentals
4. gas exchange
5. Flow field
6. Wall heat losses
7. Combustion in gasoline engines
8. Pressure Trace Analysis
9. Combustion in Diesel engines
10. Waste heat recovery

T

**6.61 Course: Energy Policy [T-WIWI-102607]**

**Responsible:** Prof. Dr. Martin Wietschel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101464 - Energy Economics](#)

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

Events					
SS 2020	2581959	<a href="#">Energy Policy</a>	2 SWS	Lecture (V)	Wietschel
Exams					
WS 19/20	7981959	<a href="#">Energy Policy</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

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

**Prerequisites**

None.

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

V

**Energy Policy**

2581959, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

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

The availability of cheap, environmentally friendly and secure energy is crucial for human welfare. However, the increasing scarcity of resources and increasing environmental pressures, with a particular focus on climate change, threaten human welfare through economic action. Energy contributes significantly to environmental pollution. The energy industry is characterised by high regulation and a significant influence of political decisions.

At the beginning of the lecture different perspectives on energy policy will be presented and the analysis of political decision-making processes will be discussed. Then the current energy policy challenges in the area of environmental pollution, regulation and the role of energy for households and industry will be discussed. Then the actors of energy policy and energy responsibilities in Europe will be discussed. The economic approaches from traditional environmental economics and sustainability as a new policy approach will then be discussed. Finally, energy policy instruments such as the promotion of renewable energies or energy efficiency are discussed in detail and how they can be evaluated.

The lecture emphasizes the relationship between theory and practice and presents some case studies.

**Literature**

Wird in der Vorlesung bekannt gegeben.

T

**6.62 Course: Engine Measurement Techniques [T-MACH-105169]**

**Responsible:** Dr.-Ing. Sören Bernhardt  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2134137	<a href="#">Engine measurement techniques</a>	2 SWS	Lecture (V)	Bernhardt
Exams					
WS 19/20	76-T-MACH-105169	<a href="#">Engine Measurement Techniques</a>		Prüfung (PR)	Koch
SS 2020	76-T-MACH-105169	<a href="#">Engine Measurement Techniques</a>		Prüfung (PR)	Koch

**Competence Certificate**

oral examination, Duration: 0,5 hours, no auxiliary means

**Prerequisites**

none

**Recommendation**

T-MACH-102194 Combustion Engines I

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

V

**Engine measurement techniques**

2134137, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

1. Grohe, H.: Messen an Verbrennungsmotoren
2. Bosch: Handbuch Kraftfahrzeugtechnik
3. Veröffentlichungen von Firmen aus der Meßtechnik
4. Hoffmann, Handbuch der Meßtechnik
5. Klingenberg, Automobil-Meßtechnik, Band C

T

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

**Responsible:** Dr. Tristan Barczak  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24140	<a href="#">Umweltrecht</a>	2 SWS	Lecture (V)	Barczak
Exams					
WS 19/20	7500050	<a href="#">Environmental Law</a>		Prüfung (PR)	Barczak
SS 2020	7500082	<a href="#">Environmental Law</a>		Prüfung (PR)	Eichenhofer



T

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

**Responsible:** Ulf Brühann  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24666	<a href="#">Europäisches und Internationales Recht</a>	2 SWS	Lecture (V)	Brühann
Exams					
WS 19/20	7500048	<a href="#">European and International Law</a>		Prüfung (PR)	Barczak
SS 2020	7500084	<a href="#">European and International Law</a>		Prüfung (PR)	Eichenhofer

T

**6.65 Course: Exam on Climatology [T-PHYS-105594]**

**Responsible:** Prof. Dr. Joaquim José Ginete Werner Pinto  
**Organisation:** KIT Department of Physics  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Written examination	1	Each summer term	4

T

**6.66 Course: Exercises in Civil Law [T-INFO-102013]**

**Responsible:** Prof. Dr. Thomas Dreier  
Dr. Yvonne Matz

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101191 - Commercial Law](#)

Type	Credits	Recurrence	Version
Examination of another type	9	Each term	2

Events					
WS 19/20	24011	<a href="#">Commercial and Corporate Law</a>	2 SWS	Lecture (V)	Wiele
SS 2020	24504	<a href="#">Advanced Civil Law</a>	2 SWS	Lecture (V)	Matz
SS 2020	24506	<a href="#">Exercises in Civil Law</a>	2 SWS	Lecture (V)	Dreier
SS 2020	24926	<a href="#">Case Studies in Civil Law</a>	2 SWS	Practice (Ü)	Käde, Hägle
Exams					
WS 19/20	7500108	<a href="#">Commercial Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500099	<a href="#">Wirtschaftsprivatrecht</a>		Prüfung (PR)	Dreier, Matz

T

## 6.67 Course: Experimental Physics [T-PHYS-100278]

**Responsible:** Prof. Dr. Thomas Schimmel  
**Organisation:** KIT Department of Physics  
**Part of:** M-PHYS-100283 - Experimental Physics

Type	Credits	Recurrence	Version
Written examination	14	Each term	1

Events					
WS 19/20	4040011	Experimentalphysik A für die Studiengänge Elektrotechnik, Chemie, Biologie, Chemische Biologie, Geodäsie und Geoinformatik, Angewandte Geowissenschaften, Geoökologie, technische Volkswirtschaftslehre, Materialwissenschaften, Lehramt Chemie, NWT Lehramt, Lebensmittelchemie, Materialwissenschaft und Werkstofftechnik (MWT) und Diplom-Ingenieurpädagogik	4 SWS	Lecture (V)	Schimmel
WS 19/20	4040112	Übungen zur Experimentalphysik A für die Studiengänge Chemie, Biologie, Chemische Biologie, Geodäsie und Geoinformatik, Angewandte Geowissenschaften, Geoökologie, technische Volkswirtschaftslehre, Lehramt Chemie, NWT Lehramt, Lebensmittelchemie, Materialwissenschaft und Werkstofftechnik (MWT) und Diplom-Ingenieurpädagogik	2 SWS	Practice (Ü)	Schimmel, Wertz
SS 2020	4040021	Experimentalphysik B für die Studiengänge Chemie, Biologie, Chemische Biologie, Geodäsie und Geoinformatik, Angewandte Geowissenschaften, Geoökologie, Technische Volkswirtschaftslehre, Materialwissenschaften, Lehramt Chemie, NWT, Lehramt, Lebensmittelchemie, Materialwissenschaft und Werkstofftechnik (MWT) und Diplom-Ingenieurpädagogik	4 SWS	Lecture (V)	Schimmel
SS 2020	4040122	Übungen zur Experimentalphysik B für die Studiengänge Chemie, Biologie, Chemische Biologie, Geodäsie und Geoinformatik, Angewandte Geowissenschaften, Geoökologie, Technische Volkswirtschaftslehre, Materialwissenschaften, Lehramt Chemie, NWT, Lehramt, Lebensmittelchemie, Materialwissenschaft und Werkstofftechnik (MWT) und Diplom-Ingenieurpädagogik	2 SWS	Practice (Ü)	Schimmel, Wertz
Exams					

WS 19/20	7800001	<a href="#">Experimental Physics</a>	Prüfung (PR)	Schimmel
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**Competence Certificate**

Written exam (usually about 180 min)

**Prerequisites**

None

T

## 6.68 Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101414 - Methodical Foundations of OR](#)  
[M-WIWI-101421 - Supply Chain Management](#)

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

### 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

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

**Responsible:** Dr. Jan-Oliver Strych  
**Organisation:** KIT Department of Informatics  
 KIT Department of Economics and Management  
**Part of:** [M-WIWI-101578 - Fundamentals of Business Administration 2](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	1

Events					
WS 19/20	2600002		2 SWS	Lecture (V)	Strych
WS 19/20	2600003	<a href="#">Übung zu Rechnungswesen</a>	2 SWS	Practice (Ü)	Strych
Exams					
WS 19/20	7900304	<a href="#">Financial Accounting and Cost Accounting</a>		Prüfung (PR)	Ruckes

**Competence Certificate**

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

**Prerequisites**

None

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

V

2600002, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

**Literature**

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

T

**6.70 Course: Financial Accounting for Global Firms [T-WIWI-107505]**

**Responsible:** Dr. Torsten Luedecke  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

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

Events					
WS 19/20	2530242	<a href="#">Financial Accounting for Global Firms</a>	2 SWS	Lecture (V)	Luedecke
WS 19/20	2530243	<a href="#">Übung zu Financial Accounting for Global Firms</a>	SWS	Practice (Ü)	Luedecke
Exams					
WS 19/20	7900142	<a href="#">Financial Accounting for Global Firms</a>		Prüfung (PR)	Luedecke

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

Basic knowledge in corporate finance and accounting.

**Annotation**

New lecture in the winter term 2017/18.

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

V

**Financial Accounting for Global Firms**

2530242, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.

Coenenberg, A.G., Haller, A. und W. Schultze (2016): Jahresabschluss und Jahresabschlussanalyse, 24. Auflage. Schäffer-Poeschel Verlag Stuttgart.



T

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

**Responsible:** Prof. Dr. Melanie Schienle  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101608 - Statistics and Econometrics](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Events					
SS 2020	2520022	<a href="#">Financial Econometrics</a>	2 SWS	Lecture (V)	Schienle
SS 2020	2520023	<a href="#">Übungen zu Financial Econometrics I</a>	2 SWS	Practice (Ü)	Schienle, Görden

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

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

**Annotation**

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

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

V

**Financial Econometrics**

2520022, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

The student

- shows a broad knowledge of financial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

**Content:**

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

**Requirements:**

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

**Workload:**

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

**Literature**

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.

Additional literature will be discussed in the lecture.

T

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

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

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

Events					
WS 19/20	2530232	<a href="#">Financial Intermediation</a>	2 SWS	Lecture (V)	Ruckes
WS 19/20	2530233	<a href="#">Übung zu Finanzintermediation</a>	1 SWS	Practice (Ü)	Ruckes, Hoang, Benz
Exams					
WS 19/20	7900063	<a href="#">Financial Intermediation</a>		Prüfung (PR)	Ruckes

**Competence Certificate**

The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.  
 The exam is offered each semester.

**Prerequisites**

None

**Recommendation**

None

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

V

**Financial Intermediation**

2530232, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

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

T

**6.73 Course: Financial Management [T-WIWI-102605]**

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101435 - Essentials of Finance](#)

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

Events					
SS 2020	2530216	<a href="#">Financial Management</a>	2 SWS	Lecture (V)	Ruckes
SS 2020	2530217	<a href="#">Übung zu Financial Management</a>	1 SWS	Practice (Ü)	Ruckes, Schubert
Exams					
WS 19/20	7900060	<a href="#">Financial Management</a>		Prüfung (PR)	Ruckes

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to Section 4 (2), 1 of the examination regulation. The exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

Knowledge of the content of the course Business Administration: Finance and Accounting [25026/25027] is recommended.

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

V

**Financial Management**

2530216, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

- Ross, Westerfield, Jaffe, Jordan (2009): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2016): Corporate Finance, 4. Edition, Pearson Addison Wesley

T

**6.74 Course: Foundations of Informatics I [T-WIWI-102749]**

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101417 - Foundations of Informatics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	2

Events					
SS 2020	2511010	<a href="#">Foundations of Informatics I</a>	2 SWS	Lecture (V)	Sure-Vetter, Färber
SS 2020	2511011	<a href="#">Exercises to Foundations of Informatics I</a>	SWS	Practice (Ü)	Sure-Vetter, Nguyen, Noullet
Exams					
WS 19/20	7900011	<a href="#">Foundations of Informatics I</a>		Prüfung (PR)	Sure-Vetter
SS 2020	7900035	<a href="#">Foundations of Informatics I (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

**Competence Certificate**

The assessment consists of an 1h written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place 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

**Foundations of Informatics I**

2511010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture provides an introduction to basic concepts of computer science and software engineering. Essential theoretical foundations and problem-solving approaches, which are relevant in all areas of computer science, are presented and explained, as well as shown in practical implementations.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

**Learning objectives:**

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

**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**

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

**Exercises to Foundations of Informatics I**

2511011, SS 2020, SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

The exercises are related to the lecture Foundations of Informatics I.

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

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

**Learning objectives:**

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

**Literature**

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

**6.75 Course: Foundations of Informatics II [T-WIWI-102707]**

**Responsible:** Dr. rer. nat. Achim Rettinger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101417 - Foundations of Informatics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2511012	<a href="#">Foundations of Informatics II</a>	3 SWS	Lecture (V)	Landesberger von Antburg
WS 19/20	2511013	<a href="#">Tutorien zu Grundlagen der Informatik II</a>	1 SWS	Tutorial (Tu)	Landesberger von Antburg
Exams					
WS 19/20	7900012	<a href="#">Foundations of Informatics II</a>		Prüfung (PR)	Landesberger von Antburg
SS 2020	7900050	<a href="#">Foundations of Informatics II (Registration until 13 July 2020)</a>		Prüfung (PR)	Sure-Vetter

**Competence Certificate**

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation. The grade of the exam can be improved by successfully participating in the tutorials. The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

It is recommended to attend the course "Foundations of Informatics I" beforehand.

Active participation in the practical lessons is strongly recommended.

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

**Foundations of Informatics II**

2511012, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture deals with formal models for automata, languages and algorithms as well as real instances of these models, i.e. computer architecture and organization (hardware development, computer arithmetic, architecture models), programming languages (different language levels, from microprogramming to higher programming languages, as well as compiling and execution), operating systems and modes (architecture and properties of operating systems, operating system tasks, client-server systems), data organization and management (types of data organization, primary and secondary organization).

**Learning objectives:**

- Students acquire vast knowledge of methods and concepts in theoretical computer science and computer architectures.
- Based on the acquired knowledge and skills, students are capable of choosing and applying the appropriate methods and concepts for well-defined problem instances.
- Active participation in the tutorials enables students to acquire the necessary knowledge for developing appropriate solutions cooperatively.

**Recommendations:**

It is recommended to attend the course *Foundations of Informatics I* [2511010] beforehand.

Active participation in the practical lessons is strongly recommended.

**Workload:**

The total workload for this course is approximately 150 hours.

**Literature**

**Weiterführende Literatur:**

Literatur wird in der Vorlesung bekannt gegeben.



T

**6.76 Course: Foundations of Interactive Systems [T-WIWI-109816]**

**Responsible:** Prof. Dr. Alexander Mädche  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)  
[M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)  
[M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

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

Events					
SS 2020	2540560	<a href="#">Foundations of Interactive Systems</a>	3 SWS	Lecture (V)	Mädche, Loewe
Exams					
WS 19/20	7900326	<a href="#">Foundations of Interactive Systems</a>		Prüfung (PR)	Mädche

**Competence Certificate**

Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a Capstone project.

Details on the assessment will be announced during the lecture.

**Prerequisites**

None

**Recommendation**

None

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

V

**Foundations of Interactive Systems**

2540560, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

Computers have evolved from batch processors towards highly interactive systems. This offers new possibilities but also challenges for the successful design of the interaction between human and computer. Interactive systems are socio-technical systems in which users perform tasks by interacting with technology in a specific context in order to achieve specified goals and outcomes.

This lecture introduces key concepts and principles of interactive systems from a human and computer perspective. Furthermore, it describes core development processes for interactive systems as well as provides insights on the use & contexts of interactive systems with a specific focus on selected application areas in organizations and society. With this lecture, students acquire foundational knowledge to successfully design of the interaction between human and computers in business and private life.

The course is complemented with a design capstone project, where students in a team apply design methods & techniques in order to create an interactive prototype

**Learning Objectives**

The students

- have a basic understanding of key conceptual and theoretical foundations of interactive systems from a human and computer perspective
- are aware of important design principles for the design of important classes of interactive systems
- know design processes and techniques for developing interactive systems
- know how to apply the knowledge and skills gathered in the lecture for a real-world problem (as part of design-oriented capstone project)

**Prerequisites**

No specific prerequisites are required for the lecture

**Literature**

Alan Dix, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. 2003. Human-Computer Interaction (3rd Edition). Prentice-Hall, Inc., USA.

Further literature will be made available in the lecture.

T

**6.77 Course: Foundations of Mobile Business [T-WIWI-104679]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

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

Exams				
WS 19/20	7900118	<a href="#">Foundations of mobile Business</a>	Prüfung (PR)	Oberweis
SS 2020	7900001	<a href="#">Foundations of mobile Business (Registration until 13 July 2020)</a>	Prüfung (PR)	Oberweis

**Competence Certificate**

Please note that the lecture will not take place in summer semester 2020 and can only be offered again in summer semester 2021.

The assessment of this course is a written (60 min.) or (if necessary) oral examination according to §4(2) of the examination regulation.

**Prerequisites**

None

**Annotation**

Lecture and exercises are integrated.

T

**6.78 Course: Fuels and Lubricants for Combustion Engines [T-MACH-105184]**

**Responsible:** Dr.-Ing. Bernhard Ulrich Kehrwald  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	2133108	<a href="#">Fuels and Lubricants for Combustion Engines</a>	2 SWS	Lecture (V)	Kehrwald
Exams					
WS 19/20	76-T-MACH-105184	<a href="#">Fuels and Lubricants for Combustion Engines</a>		Prüfung (PR)	Kehrwald
SS 2020	76-T-MACH-105184	<a href="#">Fuels and Lubricants for Combustion Engines</a>		Prüfung (PR)	Kehrwald

**Competence Certificate**

oral examination, Duration: ca. 25 min., no auxiliary means

**Prerequisites**

none

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

V

**Fuels and Lubricants for Combustion Engines**2133108, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Introduction and basics

Fuels for Gasoline and Diesel engines

Hydrogen

Lubricants for Gasoline and Diesel engines

Coolants for combustion engines

**Literature**

Skript

T

## 6.79 Course: Fundamentals of Catalytic Exhaust Gas Aftertreatment [T-MACH-105044]

**Responsible:** Prof. Dr. Olaf Deutschmann  
 Prof. Dr. Jan-Dierk Grunwaldt  
 Dr.-Ing. Heiko Kubach  
 Prof. Dr.-Ing. Egbert Lox

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2134138	<a href="#">Fundamentals of catalytic exhaust gas aftertreatment</a>	2 SWS	Lecture (V)	Lox, Grunwaldt, Deutschmann
Exams					
WS 19/20	76-T-MACH-105044	<a href="#">Fundamentals of Catalytic Exhaust Gas Aftertreatment</a>		Prüfung (PR)	Lox
SS 2020	76-T-MACH-105044	<a href="#">Fundamentals of Catalytic Exhaust Gas Aftertreatment</a>		Prüfung (PR)	Lox

### Competence Certificate

oral examination, Duration: 25 min., no auxiliary means

### Prerequisites

none

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

V

## Fundamentals of catalytic exhaust gas aftertreatment

2134138, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Literature

Skript, erhältlich in der Vorlesung

- "Environmental Catalysis" Edited by G.Ertl, H. Knötzinger, J. Weitkamp Wiley-VCH Verlag GmbH, Weinheim, 1999 ISBN 3-527-29827-4
- "Cleaner Cars- the history and technology of emission control since the 1960s" J. R. Mondt Society of Automotive Engineers, Inc., USA, 2000 Publication R-226, ISBN 0-7680-0222-2
- "Catalytic Air Pollution Control - commercial technology" R. M. Heck, R. J. Farrauto John Wiley & Sons, Inc., USA, 1995 ISBN 0-471-28614-1
- "Automobiles and Pollution" P. Degobert Editions Technic, Paris, 1995 ISBN 2-7108-0676-2
- "Reduced Emissions and Fuel Consumption in Automobile Engines" F. Schaefer, R. van Basshuysen, Springer Verlag Wien New York, 1995 ISBN 3-211-82718-8
- "Autoabgaskatalysatoren: Grundlagen - Herstellung - Entwicklung - Recycling - Ökologie" Ch. Hagelüken und 11 Mitautoren, Expert Verlag, Renningen, 2001 ISBN 3-8169-1932-4

T

**6.80 Course: Fundamentals of Production Management [T-WIWI-102606]**

**Responsible:** Prof. Dr. Frank Schultmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101437 - Industrial Production I](#)

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

Events					
SS 2020	2581950	<a href="#">Fundamentals of Production Management</a>	2 SWS	Lecture (V)	Schultmann
SS 2020	2581951	<a href="#">Übungen Grundlagen der Produktionswirtschaft</a>	2 SWS	Practice (Ü)	Stallkamp, Steins
Exams					
WS 19/20	7981950	<a href="#">Fundamentals of Production 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. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

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

V

**Fundamentals of Production Management**

2581950, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

This lecture focuses on strategic production management with respect to various economic aspects. Interdisciplinary approaches of systems theory will be used to describe the challenges of industrial production. This course will emphasize the importance of R&D as the central step in strategic corporate planning to ensure future long-term success. In the field of site selection and planning for firms and factories, attention will be drawn upon individual aspects of existing and greenfield sites as well as existing distribution and supply centres. Students will obtain knowledge in solving internal and external transport and storage problems.

**Literature**

Wird in der Veranstaltung bekannt gegeben.

T

**6.81 Course: Gas Engines [T-MACH-102197]**

**Responsible:** Dr.-Ing. Rainer Golloch  
Dr.-Ing. Heiko Kubach

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Exams				
SS 2020	76-T-MACH-102197	<a href="#">Gas Engines</a>	Prüfung (PR)	Koch

**Competence Certificate**

Oral examination, duration 25 min., no auxiliary means

**Prerequisites**

none

**T** **6.82 Course: Gear Cutting Technology [T-MACH-102148]**

**Responsible:** Dr.-Ing. Markus Klaiber  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

<b>Type</b> Oral examination	<b>Credits</b> 4	<b>Recurrence</b> Each winter term	<b>Version</b> 1
---------------------------------	---------------------	---------------------------------------	---------------------

Events					
WS 19/20	2149655	<a href="#">Gear Technology</a>	2 SWS	Lecture (V)	Klaiber
Exams					
WS 19/20	76-T-MACH-102148	<a href="#">Gear Technology</a>		Prüfung (PR)	Klaiber

**Competence Certificate**  
 Oral Exam (20 min)

**Prerequisites**  
 none

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

**V** **Gear Technology** **Lecture (V)**  
 2149655, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Content**

Based on the gearing theory, manufacturing processes and machine technologies for producing gearings, the needs of modern gear manufacturing will be discussed in the lecture. For this purpose, various processes for various gear types are taught which represent the state of the art in practice today. A classification in soft and hard machining and furthermore in cutting and non-cutting technologies will be made. For comprehensive understanding the processes, machine technologies, tools and applications of the manufacturing of gearings will be introduced and the current developments presented. For assessment and classification of the applications and the performance of the technologies, the methods of mass production and manufacturing defects will be discussed. Sample parts, reports from current developments in the field of research and an excursion to a gear manufacturing company round out the lecture.

**Learning Outcomes:**

The students ...

- can describe the basic terms of gearings and are able to explain the imparted basics of the gearwheel and gearing theory.
- are able to specify the different manufacturing processes and machine technologies for producing gearings. Furthermore they are able to explain the functional principles and the dis-/advantages of these manufacturing processes.
- can apply the basics of the gearing theory and manufacturing processes on new problems.
- are able to read and interpret measuring records for gearings. are able to make an appropriate selection of a process based on a given application
- can describe the entire process chain for the production of toothed components and their respective influence on the resulting workpiece properties.

**Workload:**

regular attendance: 21 hours  
 self-study: 99 hours



**Literature**

**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

## 6.83 Course: General and Inorganic Chemistry [T-CHEMBIO-101866]

**Responsible:** Prof. Dr. Mario Ruben**Organisation:** KIT Department of Chemistry and Biosciences**Part of:** M-CHEMBIO-102335 - General and Inorganic Chemistry

Type	Credits	Recurrence	Version
Written examination	7	Each winter term	1

Events					
WS 19/20	5004	Allgemeine und Anorganische Chemie (für Studierende des Chemieingenieurwesens)	3 SWS	Lecture (V)	Ruben
WS 19/20	5005	Seminar zur Vorlesung Allgemeine und Anorganische Chemie (für Studierende des Chemieingenieurwesens)	2 SWS	Seminar (S)	Scheiba
Exams					
WS 19/20	7100003	General and Inorganic Chemistry		Prüfung (PR)	Anson, Ruben
WS 19/20	7100004	General and Inorganic Chemistry		Prüfung (PR)	Ruben, Anson

T

## 6.84 Course: Geological Hazards and Risk [T-PHYS-103525]

**Responsible:** Dr. Ellen Gottschämmer**Organisation:** KIT Department of Physics**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Examination of another type	8	Each winter term	2

Events					
WS 19/20	4060121	<a href="#">Geological Hazards and Risk</a>	2 SWS	Lecture (V)	Gottschämmer, Daniell
WS 19/20	4060122	<a href="#">Exercises on Geological Hazards and Risk</a>	2 SWS	Practice (Ü)	Gottschämmer, Daniell
Exams					
WS 19/20	7800114	<a href="#">Geological Hazards and Risk</a>		Prüfung (PR)	Gottschämmer

T

**6.85 Course: Global Optimization I [T-WIWI-102726]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101414 - Methodical Foundations of OR](#)

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

Exams				
WS 19/20	7900005_WS1920_NK	<a href="#">Global Optimization I</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

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

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

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

**Prerequisites**

None

**Recommendation**

None

**Annotation**

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

T

**6.86 Course: Global Optimization I and II [T-WIWI-103638]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

Exams				
WS 19/20	7900007_WS1920_NK	<a href="#">Global Optimization I and II</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lectures will not be offered in summer semester 2020.

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

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

**Prerequisites**

None

**Recommendation**

None

**Annotation**

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

T

**6.87 Course: Global Optimization II [T-WIWI-102727]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

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

Exams				
WS 19/20	7900006_WS1920_NK	<a href="#">Global Optimization II</a>	Prüfung (PR)	Stein

**Competence Certificate**

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

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

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

**Prerequisites**

None

**Annotation**

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

**6.88 Course: Human Resource Management [T-WIWI-102909]**

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101513 - Human Resources and Organizations](#)

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

Events					
WS 19/20	2573005	<a href="#">Human Resource Management</a>	2 SWS	Lecture (V)	Nieken
WS 19/20	2573006	<a href="#">Übung zu Human Resource Management</a>	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
WS 19/20	7900200	<a href="#">Human Resource Management</a>		Prüfung (PR)	Nieken

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.  
 In case of a small number of registrations, we might offer an oral exam instead of a written exam.

**Prerequisites**

None

**Recommendation**

Completion of module Business Administration is recommended.  
 Basic knowledge of microeconomics, game theory, and statistics is recommended.

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

**Human Resource Management**

2573005, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Content**

The students acquire basic knowledge in the fields of human resource planning, selection and talent management. Different processes and instruments and their link to corporate strategy are evaluated based on microeconomic and behavioral approaches. The results are tested and discussed based on empirical data.

**Aim**

The student

- understands the processes and instruments of human resource management.
- analyzes different methods of human resource planning and selection and evaluates their usefulness.
- analyzes different processes of talent management and evaluates the strengths and weaknesses.
- understands the challenges of human resource management and its link to corporate strategy.

**Workload**

The total workload for this course is approximately 135 hours.

Lecture: 32h

Preparation of lecture: 52h

Exam preparation: 51h.

**Literature**

- Personnel Economics in Practice, Lazear & Gibbs, John Wiley & Sons, 2014
- Strategic Human Resources. Frameworks for General Managers, Baron & Kreps, John Wiley & Sons, 1999

T

## 6.89 Course: Hydraulic Engineering and Water Management [T-BGU-101667]

**Responsible:** Prof. Dr. Franz Nestmann**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	1

Events					
WS 19/20	6200511	<a href="#">Wasserbau und Wasserwirtschaft</a>	2 SWS	Lecture (V)	Nestmann
WS 19/20	6200512	<a href="#">Übungen zu Wasserbau und Wasserwirtschaft</a>	1 SWS	Practice (Ü)	Seidel
Exams					
WS 19/20	8230101667	<a href="#">Hydraulic Engineering and Water Management</a>		Prüfung (PR)	Nestmann

**Competence Certificate**

written exam with 60 minutes

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None



T

**6.90 Course: Hydrology [T-BGU-101693]**

**Responsible:** Prof. Dr.-Ing. Erwin Zehe  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	2

Events					
WS 19/20	6200513	<a href="#">Hydrologie</a>	2 SWS	Lecture (V)	Zehe, Wienhöfer
WS 19/20	6200514	<a href="#">Übungen zu Hydrologie</a>	1 SWS	Practice (Ü)	Zehe, Wienhöfer
Exams					
WS 19/20	8230101693	<a href="#">Hydrology</a>		Prüfung (PR)	Wienhöfer, Zehe

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T

**6.91 Course: I4.0 Systems Platform [T-MACH-106457]**

**Responsible:** Dipl.-Ing. Thomas Maier  
Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

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

Events					
WS 19/20	2123900	<a href="#">I4.0 Systems platform</a>	4 SWS	Prüfung (PR)	Ovtcharova, Maier
SS 2020	2123900	<a href="#">I4.0 Systems platform</a>	4 SWS	Project (PRO)	Ovtcharova, Maier
Exams					
WS 19/20	76-T-MACH-106457	<a href="#">I4.0 Systems platform</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**

Alternative exam assessment (project work)

**Prerequisites**

None

**Annotation**

Limited number of participants.

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

V

**I4.0 Systems platform**

2123900, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

**Prüfung (PR)****Content**

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

**Literature**

Keine / None

V

**I4.0 Systems platform**

2123900, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

**Project (PRO)**

**Content**

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

**Literature**

Keine / None

T

**6.92 Course: Industrial Organization [T-WIWI-102844]**

**Responsible:** Prof. Dr. Johannes Philipp Reiß  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101420 - Econometrics and Economics](#)  
[M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	1

Events					
SS 2020	2560238	<a href="#">Industrial Organization</a>	2 SWS	Lecture (V)	Reiß, Peters
SS 2020	2560239	<a href="#">Übung zu Industrieökonomie</a>	2 SWS	Practice (Ü)	Peters, Reiß
Exams					
WS 19/20	7900310	<a href="#">Industrial Organization</a>		Prüfung (PR)	Reiß

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

Completion of the module Economics [WW1VWL] is assumed.

**Annotation**

This course is not given in summer 2017.

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

V

**Industrial Organization**

2560238, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Verpflichtende Literatur:**

H. Bester (2012): Theorie der Industrieökonomik, Springer-Verlag.

**Ergänzende Literatur:**

J. Tirole (1988): Theory of Industrial Organization, MIT Press.

D. Carlton / J. Perloff (2005): Modern Industrial Organization, Pearson.

P. Belleflamme / M. Peitz (2010): Industrial Organization

T

**6.93 Course: Information Engineering [T-MACH-102209]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Each term	2

Events					
SS 2020	2122014	<a href="#">Information Engineering</a>	2 SWS	Seminar (S)	Ovtcharova, Mitarbeiter
Exams					
WS 19/20	76-T-MACH-102209	<a href="#">Information Engineering</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**

Alternative exam assessment (written composition and speech)

**Prerequisites**

None

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

V

**Information Engineering**2122014, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****Content**

Seminar papers on current research topics of the Institute for Information Management in Engineering. The respective topics are presented at the beginning of each semester.

**Literature**

Themenspezifische Literatur

## T

## 6.94 Course: Integrated Information Systems for Engineers [T-MACH-102083]

**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	2

Events					
SS 2020	2121001	<a href="#">Integrated Information Systems for engineers</a>	3 SWS	Lecture / Practice (VÜ)	Ovtcharova, Elstermann
Exams					
WS 19/20	76-T-MACH-102083	<a href="#">Integrated Information Systems for Engineers</a>		Prüfung (PR)	Ovtcharova

#### Competence Certificate

Oral examination 20 min.

#### Prerequisites

None

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

## V

### Integrated Information Systems for engineers

2121001, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

#### Content

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

Students can:

- illustrate the structure and operating mode of information systems
- describe the structure of relational databases
- describe the fundamentals of knowledge management and its application in engineering and deploy ontology as knowledge representation
- describe different types of process modelling and their application and illustrate and execute simple work flows and processes with selected tools
- explain different goals of specific IT systems in product development (CAD, CAP, CAM, PPS, ERP, PDM) and assign product development processes

#### Literature

Vorlesungsfolien / lecture slides

T

## 6.95 Course: Integrated Production Planning in the Age of Industry 4.0 [T-MACH-109054]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101272 - Integrated Production Planning](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

Events					
SS 2020	2150660	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>	6 SWS	Lecture / Practice (VÜ)	Lanza
Exams					
WS 19/20	76-T-MACH-109054	<a href="#">Integrated Production Planning in the Age of Industry 4.0</a>		Prüfung (PR)	Lanza

### Competence Certificate

Written Exam (120 min)

### Prerequisites

"T-MACH-108849 - Integrierte Produktionsplanung im Zeitalter von Industrie 4.0" as well as "T-MACH-102106 Integrierte Produktionsplanung" must not be commenced.

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

V

## Integrated Production Planning in the Age of Industry 4.0

2150660, SS 2020, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

**Content**

Integrated production planning in the age of industry 4.0 will be taught in the context of this engineering science lecture. In addition to a comprehensive introduction to Industry 4.0, the following topics will be addressed at the beginning of the lecture:

- Basics, history and temporal development of production
- Integrated production planning and integrated digital engineering
- Principles of integrated production systems and further development with Industry 4.0

Building on this, the phases of integrated production planning are taught in accordance with VDI Guideline 5200, whereby special features of parts production and assembly are dealt with in the context of case studies:

- Factory planning system
- Definition of objectives
- Data collection and analysis
- Concept planning (structural development, structural dimensioning and rough layout)
- Detailed planning (production planning and control, fine layout, IT systems in an industry 4.0 factory)
- Preparation and monitoring of implementation
- Start-up and series support

The lecture contents are rounded off by numerous current practical examples with a strong industry 4.0 reference. Within the exercises the lecture contents are deepened and applied to specific problems and tasks.

**Learning Outcomes:**

The students ...

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

**Workload:****MACH:**

regular attendance: 63 hours

self-study: 177 hours

**WING:**

regular attendance: 63 hours

self-study: 207 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).



T

## 6.96 Course: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]

**Responsible:** Dr. Karl-Hubert Schlichtenmayer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Written examination	4	Each summer term	1

Events					
SS 2020	2150601	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>	2 SWS	Lecture (V)	Schlichtenmayer
Exams					
WS 19/20	76-T-MACH-105188	<a href="#">Integrative Strategies in Production and Development of High Performance Cars</a>		Prüfung (PR)	Schlichtenmayer

### Competence Certificate

Written Exam (60 min)

### Prerequisites

none

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

V

## Integrative Strategies in Production and Development of High Performance Cars

2150601, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples.

The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

**Learning Outcomes:**

The students ...

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

**6.97 Course: International Finance [T-WIWI-102646]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101402 - eFinance](#)  
[M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2530570	<a href="#">International Finance</a>	2 SWS	Lecture (V)	Walter, Uhrig-Homburg
Exams					
WS 19/20	7900052	<a href="#">International Finance</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

See German version.

**Prerequisites**

None

**Recommendation**

None

**Annotation**

See German version.

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

V

**International Finance**2530570, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.

T

**6.98 Course: International Marketing [T-WIWI-102807]**

**Responsible:** Dr. Sven Feurer  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

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

Events					
WS 19/20	2572155	<a href="#">International Marketing</a>	1 SWS	Lecture (V)	Feurer
Exams					
WS 19/20	7900123	<a href="#">International Marketing</a>		Prüfung (PR)	Klarmann
WS 19/20	7900128	<a href="#">International Marketing</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

**International Marketing**

2572155, WS 19/20, 1 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

Doing marketing abroad creates a number of significant new challenges for firms. This class is intended to prepare you for meeting these challenges. In the first session, we will discuss the peculiarities of international marketing. The next five sessions will then be dedicated to methods that can be used to address them. For instance, we will look at the following issues:

- Internationalization strategies
- Market entry strategies
- Standardization vs. individualization (e.g. regarding products, prices, and communication)
- Measurement equivalence in international market research

In the final session, we will apply this knowledge to the case of Wal Mart. In particular, Wal Mart, despite being the largest retailing company worldwide, failed to successfully enter the German Market. We will discuss Wal Mart's failure using the methods taught in the weeks before.

### Students

- know the characteristics of international marketing
- are familiar with the Hofstede's cultural dimensions theory
- understand basic concepts of cultural learning (the concept of acculturation, the psychic distance paradox)
- know different concepts that explain international buying behavior (e.g. country-of-origin effects)
- comprehend different concepts for market entries in an international context ("waterfall"-strategy, "sprinkler"-strategy, method of analogy, chain ratio method)
- understand what needs to be considered regarding international market research (dealing with ethical dilemmas, challenges regarding primary and secondary data sources, testing measurement equivalence, linguistic equivalence, differences in the response styles of questionnaires)
- know the particularities of international product policy (standardization vs. differentiation, challenge of branding, fight against product plagiarism, brand counterfeiting and product piracy, protection of intellectual property)
- are familiar with the particularities in the international price policy (BigMac Index, how to deal with price demand functions to achieve profit maximization, arbitrage, price corridor, standardization vs. differentiation of prices, how to deal with currency risks, inflation, exchange rates and different willingness to pay)
- know the characteristics of the international communication policy (different laws, problems regarding international standardized campaigns)
- know particularities of the international sales policy (international channels, differences of contract negotiations)
- are able to organize international marketing departments and subsidiaries
- know the problems of marketing in emerging markets

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The total workload for this course is approximately 45.0 hours. For further information see German version.

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

### Literature

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

T

**6.99 Course: Internet Law [T-INFO-101307]**

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

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	2

Events					
WS 19/20	24354	<a href="#">Internet Law</a>	2 SWS	Lecture (V)	Dreier
Exams					
WS 19/20	7500060	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500057	<a href="#">Internet Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.100 Course: Internship [T-WIWI-102756]**

**Responsible:** Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101610 - Internship](#)

Type	Credits	Version
Completed coursework	10	1

**Competence Certificate**

See module description

**Prerequisites**

See module description

**Recommendation**

See module description

**Annotation**

See module description

**6.101 Course: Introduction to Energy Economics [T-WIWI-102746]**

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101464 - Energy Economics](#)

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

Events					
SS 2020	2581010	<a href="#">Introduction to Energy Economics</a>	2 SWS	Lecture (V)	Fichtner
SS 2020	2581011	<a href="#">Übungen zu Einführung in die Energiewirtschaft</a>	2 SWS	Practice (Ü)	Lehmann, Sandmeier, Ardone
Exams					
WS 19/20	7981010	<a href="#">Introduction to Energy Economics</a>		Prüfung (PR)	Fichtner

**Competence Certificate**

The assessment consists of a written exam (90 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:*

**Introduction to Energy Economics**

2581010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

1. Introduction: terms, units, conversions
2. The energy carrier gas (reserves, resources, technologies)
3. The energy carrier oil (reserves, resources, technologies)
4. The energy carrier hard coal (reserves, resources, technologies)
5. The energy carrier lignite (reserves, resources, technologies)
6. The energy carrier uranium (reserves, resources, technologies)
7. The final carrier source electricity
8. The final carrier source heat
9. Other final energy carriers (cooling energy, hydrogen, compressed air)

The student is able to

- characterize and judge the different energy carriers and their peculiarities,
- understand contexts related to energy economics.

**Literature****Weiterführende Literatur:**

Pfaffenberger, Wolfgang. Energiewirtschaft. ISBN 3-486-24315-2  
 Feess, Eberhard. Umweltökonomie und Umweltpolitik. ISBN 3-8006-2187-8  
 Müller, Leonhard. Handbuch der Elektrizitätswirtschaft. ISBN 3-540-67637-6  
 Stoft, Steven. Power System Economics. ISBN 0-471-15040-1  
 Erdmann, Georg. Energieökonomik. ISBN 3-7281-2135-5



T

**6.102 Course: Introduction to Engineering Geology [T-BGU-101500]****Responsible:** Prof. Dr. Philipp Blum**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	6339057	<a href="#">Einführung in die Ingenieurgeologie</a>	4 SWS	Lecture / Practice (VÜ)	Blum
Exams					
WS 19/20	8210_101500	<a href="#">Introduction to Engineering Geology</a>		Prüfung (PR)	Blum

**Prerequisites**

none

## T

## 6.103 Course: Introduction to Game Theory [T-WIWI-102850]

**Responsible:** Prof. Dr. Clemens Puppe  
Prof. Dr. Johannes Philipp Reiß

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

**Part of:** [M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101501 - Economic Theory](#)

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

Events					
SS 2020	2520525	<a href="#">Introduction to Game Theory</a>	2 SWS	Lecture (V)	Puppe
SS 2020	2520526	<a href="#">Übungen zu Einführung in die Spieltheorie</a>	1 SWS	Practice (Ü)	Puppe
Exams					
WS 19/20	7900311	<a href="#">Introduction to Game Theory</a>		Prüfung (PR)	Reiß

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation. The exam takes place in the recess period and can be resited at every ordinary examination date.

**Prerequisites**

None

**Recommendation**

Basic knowledge of mathematics and statistics is assumed.

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

## V

**Introduction to Game Theory**

2520525, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course focusses on non-cooperative game theory. It discusses models, solution concepts, and applications for simultaneous games as well as sequential games. Various solution concepts, e.g., Nash equilibrium and subgame-perfect equilibrium, are introduced along with more advanced concepts. A short introduction to cooperative game theory is given if there is sufficient time.

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

The exam takes place in the recess period and can be resited at every ordinary examination date.

The module [M-WIWI-101398] *Introduction to Economics* must have been passed.

**Recommendations:**

Basic knowledge of mathematics and statistics is assumed.

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

This course offers an introduction to the theoretical analysis of strategic interaction situations. At the end of the course, students shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings.

**Compulsory textbook:**

Gibbons (1992): *A Primer in Game Theory*, Harvester-Wheatsheaf.

**Additional Literature:**

Berninghaus/Ehrhart/Güth (2010): *Strategische Spiele*, Springer Verlag.

Binmore (1991): *Fun and Games*, DC Heath.

Fudenberg/Tirole (1991): *Game Theory*, MIT Press.

Heifetz (2012): *Game Theory*, Cambridge Univ. Press.

**Literature**

**Verpflichtende Literatur:**

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

**Ergänzende Literatur:**

Berninghaus/Ehrhart/Güth (2010): Strategische Spiele, Springer Verlag.

Binmore (1991): Fun and Games, DC Heath.

Fudenberg/Tirole (1991): Game Theory, MIT Press.

Heifetz (2012): Game Theory, Cambridge Univ. Press.

T

## 6.104 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [T-BGU-101681]

**Responsible:** Dr.-Ing. Norbert Rösch  
Dr.-Ing. Sven Wursthorn

**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (VÜ)	Rösch, Wursthorn
Exams					
WS 19/20	8280101681	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences</a>		Prüfung (PR)	Rösch, Wursthorn

**T** **6.105 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]**

**Responsible:** Dr.-Ing. Norbert Rösch  
 Dr.-Ing. Sven Wursthorn  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

<b>Type</b> Completed coursework	<b>Credits</b> 3	<b>Recurrence</b> Each winter term	<b>Version</b> 1
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Events					
WS 19/20	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (VÜ)	Rösch, Wursthorn
Exams					
WS 19/20	8280101681	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences</a>		Prüfung (PR)	Rösch, Wursthorn
WS 19/20	8280103541	<a href="#">Introduction to GIS for Students of Natural, Engineering and Geo Sciences</a>		Prüfung (PR)	Rösch, Wursthorn

T

**6.106 Course: Introduction to Microsystem Technology I [T-MACH-105182]**

**Responsible:** Dr. Vlad Badilita  
 Dr. Mazin Joude  
 Prof. Dr. Jan Gerrit Korvink

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2141861	<a href="#">Introduction to Microsystem Technology I</a>	2 SWS	Lecture (V)	Korvink, Badilita
Exams					
WS 19/20	76-T-MACH-105182	<a href="#">Introduction to Microsystem Technology I</a>		Prüfung (PR)	Korvink, Badilita

**Competence Certificate**

written examination (60 min)

**Prerequisites**

none

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

V

**Introduction to Microsystem Technology I**

2141861, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Mikrosystemtechnik für Ingenieure, W. Menz und J. Mohr, VCH Verlagsgesellschaft, Weinheim 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T

**6.107 Course: Introduction to Microsystem Technology II [T-MACH-105183]**

**Responsible:** Dr. Mazin Jouda  
Prof. Dr. Jan Gerrit Korvink

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	2142874	<a href="#">Introduction to Microsystem Technology II</a>	2 SWS	Lecture (V)	Korvink, Badilita
Exams					
WS 19/20	76-T-MACH-105183	<a href="#">Introduction to Microsystem Technology II</a>		Prüfung (PR)	Korvink, Badilita

**Competence Certificate**  
written examination (60 min)

**Prerequisites**  
none

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

V

**Introduction to Microsystem Technology II**

2142874, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

**Literature**

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T

## 6.108 Course: Introduction to Operations Research I and II [T-WIWI-102758]

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

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

**Part of:** [M-WIWI-101418 - Introduction to Operations Research](#)

Type	Credits	Recurrence	Version
Written examination	9	see Annotations	1

Events					
WS 19/20	2530043	<a href="#">Introduction to Operations Research II</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2530044		SWS	Tutorial (Tu)	Assistenten, Stein
SS 2020	2550040	<a href="#">Introduction to Operations Research I</a>	2 SWS	Lecture (V)	Rebennack
Exams					
WS 19/20	7900001_WS1920_HK	<a href="#">Introduction to Operations Research I and II</a>		Prüfung (PR)	Stein

### Competence Certificate

The assessment of the module is carried out by a written examination (120 minutes) according to Section 4(2), 1 of the examination regulation.

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

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

### Prerequisites

None

### Recommendation

Mathematics I und II. Programming knowledge for computing exercises.

It is strongly recommended to attend the course *Introduction to Operations Research I* [2550040] before attending the course *Introduction to Operations Research II* [2530043].

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

V

### Introduction to Operations Research II

2530043, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

Integer and Combinatorial Programming: Basic notions, cutting plane methods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dynamical and stochastic inventory models, queuing theory.

### Learning objectives:

The student

- names and describes basic notions of integer and combinatorial optimization, nonlinear programming, and dynamic programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.



**Literature**

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

**Introduction to Operations Research I**2550040, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)****Content**

Examples for typical OR problems.

Linear Programming: Basic notions, simplex method, duality, special versions of the simplex method (dual simplex method, three phase method), sensitivity analysis, parametric optimization, game theory.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal and minimal cost flows in networks.

**Learning objectives:**

The student

- names and describes basic notions of linear programming as well as graphs and networks,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

**Literature**

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

T

## 6.109 Course: Introduction to Programming with Java [T-WIWI-102735]

**Responsible:** Prof. Dr.-Ing. Johann Marius Zöllner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101581 - Introduction to Programming](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	2

Events					
WS 19/20	2511000	<a href="#">Introduction to Programming with Java</a>	3 SWS	Lecture (V)	Zöllner
WS 19/20	2511002	<a href="#">Tutorien zu Programmieren I: Java</a>	1 SWS	Tutorial (Tu)	Zöllner, Struppek, Ulrich
WS 19/20	2511003	<a href="#">Computer lab Introduction to Programming with Java</a>	2 SWS		Zöllner, Struppek, Ulrich
Exams					
WS 19/20	7900018	<a href="#">Introduction to Programming with Java</a>		Prüfung (PR)	Zöllner
SS 2020	7900042	<a href="#">Introduction to Programming with Java (Registration until 15 June 2020)</a>		Prüfung (PR)	Zöllner

### Competence Certificate

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

The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

### Annotation

see german version

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

V

## Introduction to Programming with Java

2511000, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The lecture "Introduction to Programming with Java " introduces systematic programming and provides essential practical basics for all advanced computer science lectures.

Based on considerations of the structured and systematic design of algorithms, the most important constructs of modern higher programming languages as well as programming methods are explained and illustrated with examples. One focus of the lecture is on teaching the concepts of object-oriented Programming. Java is used as the programming language. Knowledge of this language is required in advanced computer science lectures.

At the end of the lecture period, a written examination will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

### Learning objectives:

- Knowledge of the fundamentals, methods and systems of computer science.
- The students acquire the ability to independently solve algorithmic problems in the programming language Java, which dominates in business applications.
- In doing so, they will be able to find strategic and creative answers in finding solutions to well-defined, concrete and abstract problems.

### Workload:

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

**Literature**

Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018

T

**6.110 Course: Introduction to Public Finance [T-WIWI-102877]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101403 - Public Finance](#)

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

Events					
WS 19/20	2560131	<a href="#">Introduction to Public Finance</a>	3 SWS	Lecture (V)	Wigger

**Competence Certificate**

The assessment consists of a written exam (60 min.).

**Prerequisites**

None

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

V

**Introduction to Public Finance**

2560131, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course *Introduction to Public Finance* provides an overview of the fundamental issues in public economics. The first part of the course deals with normative theories about the economic role of the state in a market economy. Welfare economics theory is offered as a base model, with which alternative normative theories are compared and contrasted. Within this theoretical framework, arguments concerning efficiency and equity are developed as justification for varying degrees of economic intervention by the state. The second part of the course deals with the positivist theory of public economics. Processes of public decision making are examined and the conditions that lead to market failures resulting from collective action problems are discussed. The third part of the course examines a variety of public spending programs, including social security systems, the public education system, and programs aimed at reducing poverty. The fifth part of the course addresses the key theoretical and political issues associated with fiscal federalism.

**Learning goals:**

Students are able to:

- critically assess the economic role of the state in a market economy
- explain and discuss key concepts in public finance, including: public goods; economic externalities; and market failure
- explain and critically discuss competing theoretical approaches to public finance, including welfare economics and public choice theory
- explain the theory of bureaucracy according to Weber and critically assess its strengths and weaknesses
- evaluate the incentives inherent in the bureaucratic model, as well as the more recent introduction of market-oriented incentives associated with public-sector reform

**Workload:**

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

**Literature**

Literatur:

Wigger, B. U. 2006. *Grundzüge der Finanzwissenschaft*. Springer: Berlin.

T

**6.111 Course: Introduction to Stochastic Optimization [T-WIWI-106546]**

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

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

Events					
SS 2020	2550470	<a href="#">Einführung in die Stochastische Optimierung</a>	2 SWS	Lecture (V)	Rebennack
SS 2020	2550471	<a href="#">Übung zur Einführung in die Stochastische Optimierung</a>	1 SWS	Practice (Ü)	Rebennack, Sinske
SS 2020	2550474	<a href="#">Rechnerübung zur Einführung in die Stochastische Optimierung</a>	SWS	Practice (Ü)	Rebennack, Sinske
Exams					
WS 19/20	7900242	<a href="#">Introduction to Stochastic Optimization</a>		Prüfung (PR)	Rebennack

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

**Prerequisites**

None.

T

**6.112 Course: Investments [T-WIWI-102604]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101435 - Essentials of Finance](#)

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

Events					
SS 2020	2530575	<a href="#">Investments</a>	2 SWS	Lecture (V)	Uhrig-Homburg, Thimme
SS 2020	2530576	<a href="#">Übung zu Investments</a>	1 SWS	Practice (Ü)	Uhrig-Homburg, Eberbach
Exams					
WS 19/20	7900054	<a href="#">Investments</a>		Prüfung (PR)	Uhrig-Homburg

**Competence Certificate**

The assessment consists of a written exam (75 min) according to Section 4(2), 1 of the examination regulation. The examination takes place in every semester. Re-examinations are offered at every ordinary 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 of Business Administration: Finance and Accounting [2610026] is recommended.

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

V

**Investments**

2530575, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Weiterführende Literatur:**

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T

**6.113 Course: Laboratory Production Metrology [T-MACH-108878]****Responsible:** Dr.-Ing. Benjamin Häfner**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

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

Events					
SS 2020	2150550	<a href="#">Laboratory Production Metrology</a>	3 SWS	Practical course (P)	Häfner
Exams					
WS 19/20	76-T-MACH-108878	<a href="#">Laboratory Production Metrology</a>		Prüfung (PR)	Häfner

**Competence Certificate**

Alternative Test Achievement: Group presentation of 15 min at the beginning of each experiment and evaluation of the participation during the experiments

and

Oral Exam (15 min)

**Prerequisites**

none

**Annotation**

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

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

V

**Laboratory Production Metrology**

2150550, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

**Practical course (P)**

**Content**

During this course, students get to know measurement systems that are used in a production system. In the age of Industry 4.0, sensors are becoming more important. Therefore, the application of in-line measurement technology such as machine vision and non-destructive testing is focussed. Additionally, laboratory based measurement technologies such as computed tomography are addressed. The students learn the theoretical background as well as practical applications for industrial examples. The students use sensors by themselves during the course. Additionally, they are trained on how to integrate sensors in production processes and how to analyze measurement data with suitable software.

The following topics are addressed:

- Classification and examples for different measurement technologies in a production environment
- Machine vision with optical sensors
- Information fusion based on optical measurements
- Robot-based optical measurements
- Non-destructive testing by means of acoustic measurements
- Coordinate measurement technology
- Industrial computed tomography
- Measurement uncertainty evaluation
- Analysis of production data by means of data mining

**Learning Outcomes:**

The students ...

- are able to name, describe and mark out different measurement technologies that are relevant in a production environment.
- are able to conduct measurements with the presented in-line and laboratory based measurement systems.
- are able to analyze measurement results and assess the measurement uncertainty of these.
- are able to deduce whether a work piece fulfills quality relevant specifications by analysing measurement results.
- are able to use the presented measurement technologies for a new task.

**Workload:**

regular attendance: 31,5 hours

self-study: 88,5 hours

**Literature**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt. Ebenso wird auf gängige Fachliteratur verwiesen.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>). Additional reference to literature will be provided, as well.



T

**6.114 Course: Laboratory Work in General and Inorganic Chemistry [T-CHEMBIO-108287]****Organisation:** KIT Department of Chemistry and Biosciences**Part of:** [M-CHEMBIO-104026 - Laboratory Work in Inorganic Chemistry](#)

Type	Credits	Version
Examination of another type	7	1

**Prerequisites**

none

T

**6.115 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](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
SS 2020	24671	<a href="#">Law of Contracts</a>	2 SWS	Lecture (V)	Hoff
Exams					
WS 19/20	7500059	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500055	<a href="#">Law of Contracts</a>		Prüfung (PR)	Dreier, Matz

T

## 6.116 Course: Learning Factory "Global Production" [T-MACH-105783]

**Responsible:** Prof. Dr.-Ing. Gisela Lanza

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	4	Each winter term	3

Events					
WS 19/20	2149612	<a href="#">Learning Factory "Global Production"</a>	2 SWS		Lanza
Exams					
WS 19/20	76-T-MACH-105783	<a href="#">Learning Factory "Global Production"</a>	Prüfung (PR)		Lanza

### Competence Certificate

Alternative test achievement (graded):

- Knowledge acquisition in the context of the seminar (3 achievements 20 min each ) with weighting 40%.
- Interaction between participants with weighting 15%.
- Scientific colloquium (in groups of 3 students approx. 45 min each) with weighting 45%.

### Prerequisites

none

### Annotation

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

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

V

### Learning Factory "Global Production"

2149612, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The learning factory "Global Production" serves as a modern teaching environment for the challenges of global production. To make this challenges come alive, students can run a production of electric motors under real production conditions.

The course is divided into e-learning units and presence dates. The e-learning units help to learn essential basics and to immerse themselves in specific topics (e.g. selection of location, supplier selection and planning of production networks). The focus of the presence appointments is the case-specific application of relevant methods for planning and control of production systems that are suitable for the location. In addition to traditional methods and tools to organize lean production systems (e.g. Kanban and JIT/ JIS, Line Balancing) the lecture in particular deals with site-specific quality assurance and scalable automation. Essential methods for quality assurance in complex production systems are taught and brought to practical experience by a Six Sigma project. In the area of scalable automation, it is important to find solutions for the adaption of the level of automation of the production system to the local production conditions (e.g. automated workpiece transport, integration of lightweight robots for process linking) and to implement them physically. At the same time safety concepts should be developed and implemented as enablers for human-robot collaboration.

The course also includes an excursion to the production plant for the manufacturing of electric motors of an industrial partner.

Main focus of the lecture:

- site selection
- site-specific factory planning
- site-specific quality assurance
- scalable automation
- supplier selection

**Learning Outcomes:**

The students are able to ...

- evaluate and select alternative locations using appropriate methods.
- use methods and tools of lean management to plan and manage production systems that are suitable for the location.
- use the Six Sigma method and apply goal-oriented process management.
- select an appropriate level of automation of the production units based on quantitative variables.
- make use of well-established methods for the evaluation and selection of suppliers.
- apply methods for planning a global production network depending on company-specific circumstances to sketch a suitable network and classify and evaluating it according to specific criteria.
- apply the learned methods and approaches with regard to problem solving in a global production environment and able to reflect their effectiveness.

**Workload:**

e-Learning: ~ 24 h

regular attendance: ~ 36 h

self-study: ~ 60 h

**Literature****Medien:**

E-Learning Plattform ilias, Powerpoint, Fotoprotokoll. Die Medien werden über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

E-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (<https://ilias.studium.kit.edu/>).

T

**6.117 Course: Logistics and Supply Chain Management [T-MACH-110771]****Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-105298 - Logistics and Supply Chain Management](#)

Type	Credits	Recurrence	Version
Written examination	9	Each summer term	1

Events					
SS 2020	2118078	<a href="#">Logistics and Supply Chain Management</a>	4 SWS	Lecture (V)	Furmans

**Competence Certificate**

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

**Prerequisites**

None

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

V

**Logistics and Supply Chain Management**

2118078, SS 2020, 4 SWS, Language: English, [Open in study portal](#)

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

Logistics and Supply Chain Management provides comprehensive and well-founded fundamentals for the crucial issues in logistics and supply chain management. Within the scope of the lectures, the interaction of different design elements of supply chains is emphasized. For this purpose, qualitative and quantitative description models are used. Methods for mapping and evaluating logistics systems and supply chains are also covered. The lecture contents are enriched by exercises and case studies and partially the comprehension of the contents is provided by case studies. The interacting of the elements will be shown, among other things, in the supply chain of the automotive industry.

T

## 6.118 Course: Logistics and Supply Chain Management [T-WIWI-102870]

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

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

**Part of:** [M-WIWI-101437 - Industrial Production I](#)

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

Events					
SS 2020	2581996	<a href="#">Logistics and Supply Chain Management</a>	2 SWS	Lecture (V)	Wiens, Schultmann
SS 2020	2581997	<a href="#">Übung zu Logistics and Supply Chain Management</a>	1 SWS	Practice (Ü)	Diehlmann, Lüttenberg
Exams					
WS 19/20	7981996	<a href="#">Logistics and Supply Chain Management</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

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

V

## Logistics and Supply Chain Management

2581996, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

Students are introduced to the methods and tools of logistics and supply chain management. They students learn the key terms and components of supply chains together with key economic trade-offs. In detail, students gain knowledge of decisions in supply chain management, such as facility location, supply chain planning, inventory management, pricing and supply chain cooperation. In this manner, students will gain knowledge in analyzing, designing and steering of decisions in the domain of logistics and supply chain management.

- Introduction: Basic terms and concepts
- Facility location and network optimization
- Supply chain planning I: flexibility
- Supply chain planning II: forecasting
- Inventory management & pricing
- Supply chain coordination I: the Bullwhip-effect
- Supply chain coordination II: double marginalization
- Supply chain risk management

### Literature

Wird in der Veranstaltung bekannt gegeben.

T

**6.119 Course: Machine Tools and Industrial Handling [T-MACH-102158]**

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101286 - Machine Tools and Industrial Handling](#)

Type	Credits	Recurrence	Version
Written examination	9	Each winter term	2

Events					
WS 19/20	2149902	<a href="#">Machine Tools and Industrial Handling</a>	6 SWS	Lecture / Practice (VÜ)	Fleischer
Exams					
WS 19/20	76-T-MACH-102158-WING	<a href="#">Machine Tools and Industrial Handling</a>		Prüfung (PR)	Fleischer

**Competence Certificate**

Written exam (120 minutes)

**Prerequisites**

"T-MACH-109055 - Werkzeugmaschinen und Handhabungstechnik" must not be commenced.

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

V

**Machine Tools and Industrial Handling**

2149902, WS 19/20, 6 SWS, Language: German, [Open in study portal](#)

**Lecture / Practice (VÜ)**

**Content**

The lecture gives an overview of the construction, use and application of machine tools and industrial handling equipment. In the course of the lecture a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools is conveyed. First, the main components of the machine tools are systematically explained and their design principles as well as the integral machine tool design are discussed. Subsequently, the use and application of machine tools will be demonstrated using typical machine examples. Based on examples from current research and industrial applications, the latest developments are discussed, especially concerning the implementation of Industry 4.0.

The individual topics are:

- Frames and frame components
- Feed axes
- Spindles
- Peripheral equipment
- Control unit
- Metrological evaluation and machine testing
- Process monitoring
- Maintenance of machine tools
- Safety assessment of machine tools
- Machine examples

**Learning Outcomes:**

The students ...

- are able to assess the use and application of machine tools and handling equipment and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of the machine tool (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of a machine tool.
- are capable of selecting and evaluating machine tools according to technical and economic criteria.

**Workload:****MACH:**

regular attendance: 63 hours

self-study: 177 hours

**WING:**

regular attendance: 63 hours

self-study: 207 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).



T

**6.120 Course: Macroeconomic Theory [T-WIWI-109121]**

**Responsible:** Prof. Dr. Johannes Brumm  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)  
[M-WIWI-101668 - Economic Policy I](#)

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

Events					
WS 19/20	2560404	<a href="#">Macroeconomic Theory</a>	2 SWS	Lecture (V)	Scheffel
WS 19/20	2560405	<a href="#">Übung zu Macroeconomic Theory</a>	1 SWS	Practice (Ü)	Pegorari
Exams					
WS 19/20	7900264	<a href="#">Macroeconomic Theory</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

**Macroeconomic Theory**

2560404, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.

T

**6.121 Course: Management Accounting 1 [T-WIWI-102800]**

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

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

Events					
SS 2020	2579900	<a href="#">Management Accounting 1</a>	2 SWS	Lecture (V)	Wouters
SS 2020	2579901	<a href="#">Übung zu Management Accounting 1 (Bachelor)</a>	2 SWS	Practice (Ü)	Riar
SS 2020	2579902		2 SWS	Practice (Ü)	Riar
Exams					
WS 19/20	79-2579900-B	<a href="#">Management Accounting 1 (Bachelor)</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579900-M	<a href="#">Management Accounting 1 (Mastervorzug und Master)</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester.

**Prerequisites**

None

**Annotation**

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

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

V

**Management Accounting 1**

2579900, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics.
- They can use financial information for various purposes in organizations.

**Examination:**

- The assessment consists of a written exam (120 minutes) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

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

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

**Übung zu Management Accounting 1 (Bachelor)**

2579901, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see Module Handbook



2579902, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see Module Handbook

T

## 6.122 Course: Management Accounting 2 [T-WIWI-102801]

**Responsible:** Prof. Dr. Marcus Wouters  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101498 - Management Accounting](#)

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

Events					
WS 19/20	2579903	<a href="#">Management Accounting 2</a>	2 SWS	Lecture (V)	Wouters
WS 19/20	2579904		2 SWS	Practice (Ü)	Ebinger
WS 19/20	2579905		2 SWS	Practice (Ü)	Ebinger
Exams					
WS 19/20	79-2579903-B	<a href="#">Management Accounting 2 (Bachelor)</a>		Prüfung (PR)	Wouters
WS 19/20	79-2579903-M	<a href="#">Management Accounting 2 (Mastervorzug und Master)</a>		Prüfung (PR)	Wouters

**Competence Certificate**

The assessment consists of a written exam (120 minutes) at the end of each semester.

**Prerequisites**

None

**Recommendation**

It is recommended to take part in the course "Management Accounting 1" before this course.

**Annotation**

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

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

V

**Management Accounting 2**

2579903, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

**Content**

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

**Learning objectives:**

- Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

**Recommendations:**

- It is recommended to take part in the course "Management Accounting 1" before this course.

**Examination:**

- The assessment consists of a written exam (120 min) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

**Workload:**

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

**Literature**

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Verlag: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- Zusätzlich werden Artikel auf ILIAS zur Vergütung gestellt.



2579904, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see ILIAS



2579905, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Practice (Ü)

**Content**

see ILIAS

T

**6.123 Course: Management and Strategy [T-WIWI-102629]**

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)

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

Events					
SS 2020	2577900	<a href="#">Management and Strategy</a>	2 SWS	Lecture (V)	Lindstädt
Exams					
WS 19/20	7900199	<a href="#">Management and Strategy</a>		Prüfung (PR)	Lindstädt

**Competence Certificate**

The assessment consists of a written exam (60 min) taking place at the beginning of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

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

V

**Management and Strategy**

2577900, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Content**

The participants learn about central concepts of strategic management along the ideal-typical strategy process: internal and external strategic analysis, concept and sources of competitive advantages, their importance when establishing competitive and corporate strategies as well as strategy assessment and implementation. This aims in particular to provide a summary of the basic concepts and models of strategic management, i.e. to provide in particular an action-oriented integration. Thereby a focus is on imparting knowledge about how price developments in oligopolistic markets can be understood, modeled and forecasted based on game theory.

Content in brief:

- Corporate management principles
- Strategic management principles
- Strategic analysis
- Competitive strategy: modelling and selection on a divisional level
- Strategies for oligopolies and networks: anticipation of dependencies
- Corporate strategy: modelling and evaluation on a corporate level
- Strategy implementation

**Learning Objectives:**

After passing this course students are able to

- prepare strategic decisions along the ideal-typical strategy process in practice ("strategic analysis").
- assess strategic options.
- explain the portfolio management (Parental advantage and best owner of business entities).
- discuss price and capacity decisions in oligopolies and explain them in examples.

**Recommendations:**

None.

**Workload:**

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

**Assessment:**

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Literature**

- Grant, R.M.: *Moderne strategische Unternehmensführung*. 1. Aufl., Weinheim 2014.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche des Unternehmens*. Wiesbaden 2004.

Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.

T

**6.124 Course: Managing Organizations [T-WIWI-102630]**

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)  
[M-WIWI-101513 - Human Resources and Organizations](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	3

Events					
WS 19/20	2577902	<a href="#">Managing Organizations</a>	2 SWS	Lecture (V)	Lindstädt
Exams					
WS 19/20	7900049	<a href="#">Managing Organizations</a>		Prüfung (PR)	Lindstädt

**Competence Certificate**

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Prerequisites**

None

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

V

**Managing Organizations**

2577902, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



**Content**

The course should enable the participants to assess the strengths and weaknesses of existing organisational structures and rules using systematic criteria. Here concepts and models for designing organisation structures, regulating organizational processes and managing organisational changes are presented and discussed using case studies. The course is structured to relate to actions and aims to give students a realistic view of the opportunities and limits of rational design approaches.

Content in brief:

- Principles of organisational management
- Managing organisational structures and processes: the selection of design parameters
- Ideal-typical organisational structures: choice and effect of parameter combinations
- Managing organisational changes

**Learning Objectives:**

After passing this course students are able to

- evaluate strengths and weaknesses of existing organisational structures and rules.
- compare alternatives of organisational structure in practice and assess and interpret them regarding their effectiveness and efficiency.
- assess the management of organisational changes.

**Recommendations:**

None.

**Workload:**

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

**Assessment:**

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

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

**Literature**

- Laux, H.; Liermann, F.: *Grundlagen der Organisation*, Springer. 6. Aufl. Berlin 2005.
- Lindstädt, H.: *Organisation*, in Scholz, C. (Hrsg.): *Vahlens Großes Personallexikon*, Verlag Franz Vahlen. 1. Aufl. München, 2009.
- Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*, Gabler. 4. Aufl. Wiesbaden 2003.

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

T

## 6.125 Course: Managing the Marketing Mix [T-WIWI-102805]

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

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

Events					
SS 2020	2571152	<a href="#">Managing the Marketing Mix</a>	2 SWS	Lecture (V)	Klarmann
SS 2020	2571153	<a href="#">Übung zu Marketing Mix (Bachelor)</a>	1 SWS	Practice (Ü)	Moosbrugger, Halbauer
Exams					
WS 19/20	7900185	<a href="#">Managing the Marketing Mix</a>		Prüfung (PR)	Klarmann

### Competence Certificate

The assessment is carried out by the preparation and presentation of a case study (max 30 points) as well as a written exam (max 60 points). In total, a maximum of 90 points can be achieved in the event.

### Prerequisites

None

### Annotation

The course is compulsory in the module "Foundations of Marketing".  
 For further information please contact Marketing & Sales Research Group ([marketing.iism.kit.edu](mailto:marketing.iism.kit.edu)).

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

V

## Managing the Marketing Mix

2571152, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The content of this course concentrates on the elements of the marketing mix. Therefore the main chapters are:

- Brand management
- Pricing
- Promotion

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

This course is compulsory within or the module "Foundations of Marketing" and must be examined.

### Learning objectives:

student

- know the meaning of the branding, the brand positioning and the possibilities of the brand value calculation
- understand the price behavior of customers and can apply this knowledge to the practice  
know different methods for price determination (conjoint analysis, cost-plus determination, target costing, customer surveys, value-in-use) and price differentiation
- are able to name and explain the relevant communication theories
- can name and judge different possibilities of the Intermediaplanung
- know various design elements of advertising communication
- understand the measurement of advertising impact and can apply it

### Workload:

The total workload for this course is approximately 135.0 hours.

**Literature**

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

T

**6.126 Course: Manufacturing Technology [T-MACH-102105]**

**Responsible:** Prof. Dr.-Ing. Volker Schulze  
Dr.-Ing. Frederik Zanger

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101276 - Manufacturing Technology](#)

Type	Credits	Recurrence	Version
Written examination	9	Each winter term	3

Events					
WS 19/20	2149657	<a href="#">Manufacturing Technology</a>	6 SWS	Lecture / Practice (VÜ)	Schulze, Zanger
Exams					
WS 19/20	76-T-MACH-102105	<a href="#">Manufacturing Technology</a>		Prüfung (PR)	Schulze

**Competence Certificate**

Written Exam (180 min)

**Prerequisites**

none

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

V

**Manufacturing Technology**

2149657, WS 19/20, 6 SWS, Language: German, [Open in study portal](#)

**Lecture / Practice (VÜ)**

**Content**

The objective of the lecture is to look at manufacturing technology within the wider context of production engineering, to provide an overview of the different manufacturing processes and to impart detailed process knowledge of the common processes. The lecture covers the basic principles of manufacturing technology and deals with the manufacturing processes according to their classification into main groups regarding technical and economic aspects. The lecture is completed with topics such as process chains in manufacturing.

The following topics will be covered:

- Quality control
- Primary processing (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming, plastics engineering)
- Cutting (machining with geometrically defined and geometrically undefined cutting edges, separating, abrading)
- Joining
- Coating
- Heat treatment and surface treatment
- Process chains in manufacturing

This lecture provides an excursion to an industry company.

**Learning Outcomes:**

The students ...

- are capable to specify the different manufacturing processes and to explain their functions.
- are able to classify the manufacturing processes by their general structure and functionality according to the specific main groups.
- have the ability to perform a process selection based on their specific characteristics.
- are enabled to identify correlations between different processes and to select a process regarding possible applications.
- are qualified to evaluate different processes regarding specific applications based on technical and economic aspects.
- are experienced to classify manufacturing processes in a process chain and to evaluate their specific influence on surface integrity of workpieces regarding the entire process chain.

**Workload:**

regular attendance: 63 hours

self-study: 177 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in ilias (<https://ilias.studium.kit.edu/>).

T

**6.127 Course: Material Flow in Logistic Systems [T-MACH-102151]****Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101277 - Material Flow in Logistic Systems](#)

Type	Credits	Recurrence	Version
Examination of another type	9	Each winter term	3

Events					
WS 19/20	2117051	<a href="#">Material flow in logistic systems</a>	6 SWS	Others (sonst.)	Furmans
Exams					
WS 19/20	76-T-MACH-102151	<a href="#">Material Flow in Logistic Systems</a>		Prüfung (PR)	Furmans

**Competence Certificate**

The assessment (Prüfungsleistung anderer Art) consists of the following assignments:

- 40% assessment of the final case study as individual performance,
- 60% semester evaluation which includes working on 5 case studies and defending those (For both assessment types, the best 4 of 5 tries count for the final grade.):
  - 40% assessment of the result of the case studies as group work,
  - 20% assessment of the oral examination during the case study colloquiums as individual performance.

A detailed description of the learning control can be found under Annotations.

**Prerequisites**

none

**Recommendation**

Recommended elective subject: Probability Theory and Statistics

**Annotation**

Students are divided into groups for this course. Five case studies are carried out in these groups. The results of the group work during the lecture period are presented and evaluated in writing. In the oral examination during the case study colloquiums, the understanding of the result of the group work and the models dealt with in the course is tested. The participation in the oral defenses is compulsory and will be controlled. For the written submission the group receives a common grade, in the oral defense each group member is evaluated individually.

After the lecture period, there is the final case study. This case study contains the curriculum of the whole semester. The students work individually on this case study which takes place at a predefined place and time (duration: 4h).

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

V

**Material flow in logistic systems**

2117051, WS 19/20, 6 SWS, Language: German, [Open in study portal](#)

Others (sonst.)

**Content****Learning Content:**

- Elements of material flow systems (conveyor elements, fork, join elements)
- Models of material flow networks using graph theory and matrices
- Queueing theory, calculation of waiting time, utilization
- Warehouseing and order-picking
- Shuttle systems
- Sorting systems
- Simulation
- Calculation of availability and reliability
- Value stream analysis

After successful completion of the course, you are able (alone and in a team) to:

- Accurately describe a material handling system in a conversation with an expert.
- Model and parameterize the system load and the typical design elements of a material handling system.
- Design a material handling system for a task.
- Assess the performance of a material handling system in terms of the requirements.
- Change the main lever for influencing the performance.
- Expand the boundaries of today's methods and system components conceptually if necessary.

**Literature:**

Arnold, Dieter; Furmans, Kai: Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 2009

**Description:**

Students are divided into groups for this course. Five case studies are carried out in these groups. The results of the group work during the lecture period are presented and evaluated in writing. During the colloquiums, the result of the case study is presented and the understanding of the group work and the models dealt with in the course are tested in an oral defense. The participation in the colloquiums is compulsory and will be controlled. For the written submission and the presentation the group receives a common grade, in the oral defense each group member is evaluated individually.

After the lecture period, there is the final case study. This case study contains the curriculum of the whole semester. The students work individually on this case study which takes place at a predefined place and time (duration: 4h).

**We strongly recommend to attend the introductory session at 16.10.2019. In this session, the teaching concept of "Materialfluss in Logistiksysteme" is explained and outstanding issues are clarified.**

**Workload:**

- Regular attendance: 35 h
- Self-study: 135 h
- Group work: 100 h

**Competence Certificate:**

The assessment (Prüfungsleistung anderer Art) consists of the following assignments:

- 40% assessment of the final case study as individual performance,
- 60% semester evaluation which includes working on 5 case studies and defending those (For both assessment types, the best 4 of 5 tries count for the final grade.):
  - 40% assessment of the result and the presentation of the case studies as group work,
  - 20% assessment of the oral examination during the colloquiums as individual performance.

T

## 6.128 Course: Mathematics I - Final Exam [T-MATH-102261]

**Responsible:** Dr. Martin Folkers  
 Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-101676 - Mathematics 1](#)

Type	Credits	Version
Written examination	3,5	1

Exams				
WS 19/20	6700013	<a href="#">Mathematics I - Final Exam</a>	Prüfung (PR)	Folkers, Last, Winter
WS 19/20	6700014	<a href="#">Mathematics I - Final Exam</a>	Prüfung (PR)	Winter, Last, Folkers



T

## 6.129 Course: Mathematics I - Midterm Exam [T-MATH-102260]

**Responsible:** Dr. Martin Folkers  
 Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-101676 - Mathematics 1](#)

Type	Credits	Version
Written examination	3,5	1

Events					
WS 19/20	0135000	<a href="#">Mathematik 1 für die Fachrichtung Wirtschaftswissenschaften</a>	4 SWS	Lecture (V)	Folkers
WS 19/20	0135100	<a href="#">Übungen zu 0135000</a>	2 SWS	Practice (Ü)	Folkers
Exams					
WS 19/20	6700040	<a href="#">Mathematics I - Midterm Exam</a>		Prüfung (PR)	Winter, Last, Folkers
WS 19/20	6700065	<a href="#">Mathematics I - Midterm Exam</a>		Prüfung (PR)	Winter, Last, Folkers

T

**6.130 Course: Mathematics II - Final Exam [T-MATH-102263]**

**Responsible:** Dr. Martin Folkers  
Prof. Dr. Daniel Hug  
Prof. Dr. Günter Last  
PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-101677 - Mathematics 2](#)

Type	Credits	Version
Written examination	3,5	1

T

## 6.131 Course: Mathematics II - Midterm Exam [T-MATH-102262]

**Responsible:** Dr. Martin Folkers  
 Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-101677 - Mathematics 2](#)

Type	Credits	Version
Written examination	3,5	1

Events					
SS 2020	0183000	<a href="#">Mathematik 2 für die Fachrichtung Wirtschaftswissenschaft</a>	4 SWS	Lecture (V)	Folkers
SS 2020	0183100	<a href="#">Übungen zu 0183000</a>	2 SWS	Practice (Ü)	Folkers

T

## 6.132 Course: Mathematics III - Final Exam [T-MATH-102264]

**Responsible:** Dr. Martin Folkers  
 Prof. Dr. Daniel Hug  
 Prof. Dr. Günter Last  
 PD Dr. Steffen Winter

**Organisation:** KIT Department of Mathematics

**Part of:** [M-MATH-101679 - Mathematics 3](#)

Type	Credits	Version
Written examination	7	1

Events					
WS 19/20	0135200	<a href="#">Mathematik 3 für die Fachrichtung Wirtschaftswissenschaften</a>	4 SWS	Lecture (V)	Winter
WS 19/20	0135300	<a href="#">Übungen zu 0135200</a>	2 SWS	Practice (Ü)	Winter
Exams					
WS 19/20	6700031	<a href="#">Mathematics III - Final Exam</a>		Prüfung (PR)	Winter, Last
WS 19/20	6700051	<a href="#">Mathematics III - Final Exam</a>		Prüfung (PR)	Winter

T

**6.133 Course: Mechanical Design Basics I and II [T-MACH-110363]**

**Responsible:** Prof. Dr.-Ing. Albert Albers  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101299 - Mechanical Design](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	2145131	<a href="#">Mechanical Design Basics I</a>	2 SWS	Lecture (V)	Albers, Matthiesen, Behrendt
SS 2020	2146131	<a href="#">Mechanical Design Basics II</a>	2 SWS	Lecture (V)	Albers, Matthiesen
Exams					
WS 19/20	76-T-MACH-104739	<a href="#">Mechanical Design I and II</a>		Prüfung (PR)	Albers, Matthiesen

**Competence Certificate**

Written Exam (90min) on the topics of MKLGI and MKLGII.

**Prerequisites**

The bricks "T-MACH-110364 - Mechanical Design Basics I, Tutorial" and "T-MACH-110365 - Mechanical Design Basics II, Tutorial" must be passed successfully.

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

V

**Mechanical Design Basics I**

2145131, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature****Vorlesungsumdruck:**

Der Umdruck zur Vorlesung kann über die eLearning-Plattform Ilias bezogen werden.

**Literatur:****Konstruktionselemente des Maschinenbaus - 1 und 2**

Grundlagen der Berechnung und Gestaltung von Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

V

**Mechanical Design Basics II**

2146131, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Design

Dimensioning

Component connections

Bolted connection

**Prerequisites:**

MIT:

In a workshop with 3 project sessions the students will be divided into groups and their knowledge will be tested. Attendance in all 3 project sessions is compulsory and is checked. In colloquia the knowledge from the lecture will be tested at the beginning of the project sessions. The successful completion of the colloquia as well as the completion of the workshop task is a prerequisite for successful participation.

**CIW/VT/IP-M/WiING/NWT/MATH/MWT:**

During the lecture, students must apply the knowledge from MKL I and II to a design task. This is then evaluated and must be passed for successful participation.

**Workload:**

Presence time: 21 h

Self study: 51 h

**Literature****Konstruktionselemente des Maschinenbaus - 1 und 2**Grundlagen der Berechnung und Gestaltung von  
Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

**Grundlagen von Maschinenelementen für Antriebsaufgaben;**

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8)

T

## 6.134 Course: Mechanical Design Basics I, Tutorial [T-MACH-110364]

**Responsible:** Prof. Dr.-Ing. Albert Albers  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101299 - Mechanical Design](#)

Type	Credits	Recurrence	Version
Completed coursework	1	Each winter term	1

Events					
WS 19/20	2145132	<a href="#">Tutorials Mechanical Design Basics I</a>	1 SWS	Practice (Ü)	Albers, Matthiesen, Behrendt, Mitarbeiter
Exams					
WS 19/20	76-T-MACH-110364	<a href="#">Mechanical Design Basics I, Tutorial</a>		Prüfung (PR)	Albers, Matthiesen

### Competence Certificate

To pass the preliminary work, attendance at 3 workshop sessions of the MKL1 transmission workshop and the passing of a colloquium at the beginning of each workshop are prerequisites.

### Prerequisites

None

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

V

## Tutorials Mechanical Design Basics I

2145132, WS 19/20, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

### Literature

#### Konstruktionselemente des Maschinenbaus - 1 und 2

Grundlagen der Berechnung und Gestaltung von Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

#### Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

#### CAD:

3D-Konstruktion mit Pro/Engineer - Wildfire, Paul Wyndorps, Europa Lehrmittel, ISBN: 978-3-8085-8948-9

Pro/Engineer Tipps und Techniken, Wolfgang Berg, Hanser Verlag, ISBN: 3-446-22711-3 (für Fortgeschrittene)

T

**6.135 Course: Mechanical Design Basics II, Tutorial [T-MACH-110365]**

**Responsible:** Prof. Dr.-Ing. Albert Albers  
Prof. Dr.-Ing. Sven Matthiesen

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101299 - Mechanical Design](#)

Type	Credits	Recurrence	Version
Completed coursework	1	Each summer term	1

Events					
SS 2020	2146132	<a href="#">Tutorials Mechanical Design Basics II</a>	2 SWS	Practice (Ü)	Albers, Matthiesen, Mitarbeiter

**Competence Certificate**

CIW/ VT/ IP-M/ WiING / NWT/ MATH/ MWT: For passing the prerequisite it is necessary that a design task is successfully completed as a technical hand drawing

MIT: To pass the preliminary examination, attendance at workshop sessions and a colloquium at the beginning of each workshop are required.

**Prerequisites**

None

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

V

**Tutorials Mechanical Design Basics II**

2146132, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

**Content**

Design

Dimensioning

Component connections

Bolted connection

**Workload:****MIT Students:**

Presence time: 18 h

Self study: 30 h

**CIW/VT/ IP-M/WiING / NWT/ MATH/ MWT**

Presence time: 10,5 h

Self study: 37,5 h

**Literature**

**Konstruktionselemente des Maschinenbaus - 1 und 2**

Grundlagen der Berechnung und Gestaltung von

Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

**Grundlagen von Maschinenelementen für Antriebsaufgaben;**

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

**CAD:**

3D-Konstruktion mit Pro/Engineer - Wildfire, Paul Wyndorps, Europa Lehrmittel, ISBN: 978-3-8085-8948-9

Pro/Engineer Tipps und Techniken, Wolfgang Berg, Hanser Verlag, ISBN: 3-446-22711-3 (für Fortgeschrittene)



T

**6.136 Course: Metal Forming [T-MACH-105177]****Responsible:** Dr. Thomas Herlan**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each summer term	1

Events					
SS 2020	2150681	<a href="#">Metal Forming</a>	2 SWS	Lecture (V)	Herlan
Exams					
WS 19/20	76-T-MACH-105177	<a href="#">Metal Forming</a>		Prüfung (PR)	Herlan
WS 19/20	76-T-MACH-105177-Wdh	<a href="#">Metal Forming - re-examination</a>		Prüfung (PR)	Herlan

**Competence Certificate**

Oral Exam (20 min)

**Prerequisites**

none

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

V

**Metal Forming**2150681, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**

**Content**

At the beginning of the lecture the basics of metal forming are briefly introduced. The focus of the lecture is on massive forming (forging, extrusion, rolling) and sheet forming (car body forming, deep drawing, stretch drawing). This includes the systematic treatment of the appropriate metal forming Machines and the corresponding tool technology. Aspects of tribology, as well as basics in material science and aspects of production planning are also discussed briefly. The plastic theory is presented to the extent necessary in order to present the numerical simulation method and the FEM computation of forming processes or tool design. The lecture will be completed by product samples from the forming technology.

The topics are as follows:

- Introduction and basics
- Hot forming
- Metal forming machines
- Tools
- Metallographic fundamentals
- Plastic theory
- Tribology
- Sheet forming
- Extrusion
- Numerical simulation

**Learning Outcomes:**

The students ...

- are able to reflect the basics, forming processes, tools, Machines and equipment of metal forming in an integrated and systematic way.
- are capable to illustrate the differences between the forming processes, tools, machines and equipment with concrete examples and are qualified to analyze and assess them in terms of their suitability for the particular application.
- are also able to transfer and apply the acquired knowledge to other metal forming problems.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

T

**6.137 Course: Microactuators [T-MACH-101910]**

**Responsible:** Prof. Dr. Manfred Kohl  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	2142881	<a href="#">Microactuators</a>	2 SWS	Lecture (V)	Kohl
Exams					
WS 19/20	76-T-MACH-101910	<a href="#">Microactuators</a>		Prüfung (PR)	Kohl

**Competence Certificate**  
written exam, 60 min.

**Prerequisites**  
none

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

V

**Microactuators**

2142881, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

- Basic knowledge in the material science of the actuation principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications

The lecture includes amongst others the following topics:

- Microelectromechanical systems: linear actuators, microrelais, micromotors
- Medical technology and life sciences: Microvalves, micropumps, microfluidic systems
- Microrobotics: Microgrippers, polymer actuators (smart muscle)
- Information technology: Optical switches, mirror systems, read/write heads

**Literature**

- Folienskript "Mikroaktorik"
- D. Jendritza, Technischer Einsatz Neuer Aktoren: Grundlagen, Werkstoffe, Designregeln und Anwendungsbeispiele, Expert-Verlag, 3. Auflage, 2008
- M. Kohl, Shape Memory Microactuators, M. Kohl, Springer-Verlag Berlin, 2004
- N.TR. Nguyen, S.T. Wereley, Fundamentals and applications of Microfluidics, Artech House, Inc. 2002
- H. Zappe, Fundamentals of Micro-Optics, Cambridge University Press 2010

## T

## 6.138 Course: Mobility and Infrastructure [T-BGU-101791]

**Responsible:** Prof. Dr.-Ing. Ralf Roos  
Prof. Dr.-Ing. Peter Vortisch

**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences

**Part of:** [M-BGU-101067 - Mobility and Infrastructure](#)

Type	Credits	Recurrence	Version
Written examination	9	Each term	2

Events					
SS 2020	6200404	<a href="#">Spatial Planning and Planning Law</a>	2 SWS	Lecture (V)	Wilske
SS 2020	6200405	<a href="#">Exercises to Spatial Planning and Planning Law</a>	1 SWS	Practice (Ü)	Wilske, Mitarbeiter/ innen
SS 2020	6200406	<a href="#">Transportation Systems</a>	2 SWS	Lecture (V)	Vortisch
SS 2020	6200407	<a href="#">Exercises to Transportation Systems</a>	SWS	Practice (Ü)	Vortisch, Mitarbeiter/ innen
SS 2020	6200408	<a href="#">Design Basics in Highway Engineering</a>	2 SWS	Lecture (V)	Roos, Zimmermann
SS 2020	6200409	<a href="#">Exercises to Design Basics in Highway Engineering</a>	SWS	Practice (Ü)	Plachkova-Dzhurova, Zimmermann
Exams					
WS 19/20	8234101791	<a href="#">Mobility and Infrastructure</a>		Prüfung (PR)	Roos

**Competence Certificate**  
written exam, 150 min.

**Prerequisites**  
None

**Recommendation**  
For students from the KIT-Department of Economics and Management it is recommended to take part in the exercises.

**Annotation**  
none

T

**6.139 Course: Model Based Application Methods [T-MACH-102199]****Responsible:** Dr. Frank Kirschbaum**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101303 - Combustion Engines II](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

**Competence Certificate**

take-home exam, short presentation with oral examination

**Prerequisites**

none

T

## 6.140 Course: Modeling and OR-Software: Introduction [T-WIWI-106199]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)

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

Events					
SS 2020	2550490	<a href="#">Modellieren und OR-Software: Einführung</a>	3 SWS	Practical course (P)	Nickel, Pomes

**Competence Certificate**

The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the software laboratory and the following term.

**Prerequisites**

None

**Recommendation**

Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [2550040] of the module *Operations Research*.

**Annotation**

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

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

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

V

**Modellieren und OR-Software: Einführung**

2550490, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

**Practical course (P)**

**Content**

After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL will be discussed which can be used to solve OR problems on a computer-aided basis. Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

T

**6.141 Course: Nanotechnology with Clusterbeams [T-MACH-102080]****Responsible:** Dr. Jürgen Gspann**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

**Competence Certificate**

written examination

presence in more than 70% of the lectures

Duration: 1 h

aids: none

**Prerequisites**

none

T

## 6.142 Course: Nonlinear Optimization I [T-WIWI-102724]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

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

Events					
WS 19/20	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
Exams					
WS 19/20	7900002_WS1920_HK	<a href="#">Nonlinear Optimization I</a>		Prüfung (PR)	Stein

**Competence Certificate**

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

The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of *Nonlinear Optimization II* [2550113]. In this case, the duration of the written examination takes 120 minutes.

**Prerequisites**

The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

**Annotation**

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

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

V

**Nonlinear Optimization I**

2550111, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.



**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**6.143 Course: Nonlinear Optimization I and II [T-WIWI-103637]**

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Recurrence	Version
Written examination	9	Each winter term	6

Events					
WS 19/20	2550111	<a href="#">Nonlinear Optimization I</a>	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
WS 19/20	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture (V)	Stein
Exams					
WS 19/20	7900004_WS1920_HK	<a href="#">Nonlinear Optimization I and II</a>		Prüfung (PR)	Stein

**Competence Certificate**

The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

**Prerequisites**

None.

**Annotation**

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

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

**Nonlinear Optimization I**

2550111, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**Nonlinear Optimization II**

2550113, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

**Learning objectives:**

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T

## 6.144 Course: Nonlinear Optimization II [T-WIWI-102725]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101414 - Methodical Foundations of OR](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2550112	<a href="#">Exercises Nonlinear Optimization I + II</a>	SWS	Practice (Ü)	Stein
WS 19/20	2550113	<a href="#">Nonlinear Optimization II</a>	2 SWS	Lecture (V)	Stein
Exams					
WS 19/20	7900003_WS1920_HK	<a href="#">Nonlinear Optimization II</a>		Prüfung (PR)	Stein

### Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

The exam can also be combined with the examination of *Nonlinear Optimization I* [2550111]. In this case, the duration of the written exam takes 120 minutes.

### Prerequisites

None.

### Annotation

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

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

V

## Nonlinear Optimization II

2550113, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

### Remark:

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

### Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

**Literature**

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

**Weiterführende Literatur:**

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T

## 6.145 Course: Novel Actuators and Sensors [T-MACH-102152]

**Responsible:** Prof. Dr. Manfred Kohl  
Dr. Martin Sommer

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	3

Events					
WS 19/20	2141865	<a href="#">Novel actuators and sensors</a>	2 SWS	Lecture (V)	Kohl, Sommer
Exams					
WS 19/20	76-T-MACH-102152	<a href="#">Novel Actuators and Sensors</a>		Prüfung (PR)	Kohl, Sommer

**Competence Certificate**  
written exam, 60 minutes

**Prerequisites**  
none

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

V

## Novel actuators and sensors

2141865, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- Vorlesungsskript "Neue Aktoren" und Folienskript "Sensoren"
- Donald J. Leo, Engineering Analysis of Smart Material Systems, John Wiley & Sons, Inc., 2007
- "Sensors Update", Edited by H.Baltes, W. Göpel, J. Hesse, VCH, 1996, ISBN: 3-527-29432-5
- "Multivariate Datenanalyse – Methodik und Anwendungen in der Chemie", R. Henrion, G. Henrion, Springer 1994, ISBN 3-540-58188-X

T

## 6.146 Course: Optimization under Uncertainty [T-WIWI-106545]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

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

Events					
WS 19/20	2550464	<a href="#">Optimierungsansätze unter Unsicherheit</a>	SWS	Lecture (V)	Rebennack
WS 19/20	2550465	<a href="#">Übungen zu Optimierungsansätze unter Unsicherheit</a>	SWS	Practice (Ü)	Rebennack, Füllner
WS 19/20	2550466		2 SWS	Practice (Ü)	Rebennack, Füllner
Exams					
WS 19/20	7900240	<a href="#">Optimization under Uncertainty</a>		Prüfung (PR)	Rebennack
WS 19/20	7900330	<a href="#">Optimization under Uncertainty</a>		Prüfung (PR)	Rebennack

**Competence Certificate**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

**Prerequisites**

None.

T

**6.147 Course: Optoelectronic Components [T-ETIT-101907]****Responsible:** Prof. Dr. Wolfgang Freude**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	2309486	<a href="#">Optoelectronic Components</a>	2 SWS	Lecture (V)	Freude
SS 2020	2309487	<a href="#">Optoelectronic Components (Tutorial)</a>	1 SWS	Practice (Ü)	Freude
Exams					
WS 19/20	7309486	<a href="#">Optoelectronic Components</a>		Prüfung (PR)	Freude
WS 19/20	7309486-W	<a href="#">Optoelectronic Components (Wiederholungsprüfung)</a>		Prüfung (PR)	Freude

**Prerequisites**

none



T

**6.148 Course: Patent Law [T-INFO-101310]**

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

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	2

Events					
SS 2020	24656	<a href="#">Patent Law</a>	2 SWS	Lecture (V)	Koch
Exams					
WS 19/20	7500001	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500062	<a href="#">Patent Law</a>		Prüfung (PR)	Dreier, Matz

## T

## 6.149 Course: Personnel Policies and Labor Market Institutions [T-WIWI-102908]

**Responsible:** Prof. Dr. Petra Nieken  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101513 - Human Resources and Organizations](#)  
[M-WIWI-101668 - Economic Policy I](#)

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

Events					
SS 2020	2573001	<a href="#">Personnel Policies and Labor Market Institutions</a>	2 SWS	Lecture (V)	Nieken
SS 2020	2573002	<a href="#">Übungen zu Personalpolitik und Arbeitsmarktinstitutionen</a>	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
WS 19/20	7900202	<a href="#">Personnel Policies and Labor Market Institutions</a>		Prüfung (PR)	Nieken

**Competence Certificate**

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.  
 In case of a small number of registrations, we might offer an oral exam instead of a written exam.

**Prerequisites**

None

**Recommendation**

Completion of module Business Administration is recommended.  
 Basic knowledge of microeconomics, game theory, and statistics is recommended.

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

## V

**Personnel Policies and Labor Market Institutions**

2573001, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The students acquire knowledge about the process and the strategic aspects of collective bargaining about wages. They analyze selected aspects of corporate governance and co-determination in Germany. The lecture also addresses questions of personnel politics and labor market discrimination. Microeconomic and behavioral approaches as well as empirical data is used and evaluated critically.

**Aim**

The student

- understands the process and role of agents in collective wage bargaining.
- analyzes strategic decisions in the context of corporate governance.
- understands the concept of co-determination in Germany.
- challenges statements that evaluate certain personnel politics.

**Workload**

The total workload for this course is approximately 135 hours.

Lecture 32h

Preparation of lecture 52h

Exam preparation 51h

**Literature**

Arbeitsmarktökonomik, W. Franz, Springer, 2013

T

**6.150 Course: PH APL-ING-TL01 [T-WIWI-106291]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

T

**6.151 Course: PH APL-ING-TL02 [T-WIWI-106292]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

T

**6.152 Course: PH APL-ING-TL03 [T-WIWI-106293]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

T

**6.153 Course: PH APL-ING-TL04 ub [T-WIWI-106294]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Completed coursework	0	Once	1

T

**6.154 Course: PH APL-ING-TL05 ub [T-WIWI-106295]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Completed coursework	0	Once	1



T

**6.155 Course: PH APL-ING-TL06 ub [T-WIWI-106296]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Completed coursework	0	Once	1

T

**6.156 Course: PH APL-ING-TL07 [T-WIWI-108384]****Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

Type	Credits	Recurrence	Version
Examination of another type	3	Once	1

T

**6.157 Course: Physics for Engineers [T-MACH-100530]**

**Responsible:** Prof. Dr. Martin Dienwiebel  
 Prof. Dr. Peter Gumbsch  
 Prof. Dr. Alexander Nesterov-Müller  
 Dr. Daniel Weygand

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
SS 2020	2142890	<a href="#">Physics for Engineers</a>	2 SWS	Lecture (V)	Weygand, Dienwiebel, Nesterov-Müller, Gumbsch
Exams					
WS 19/20	76-T-MACH-100530	<a href="#">Physics for Engineers</a>		Prüfung (PR)	Gumbsch, Dienwiebel, Nesterov-Müller, Weygand

**Competence Certificate**

written exam 90 min

**Prerequisites**

none

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

V

**Physics for Engineers**

2142890, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

## 1) Foundations of solid state physics

- Wave particle dualism
- Tunnelling
- Schrödinger equation
- H-atom

## 2) Electrical conductivity of solids

- solid state: periodic potentials
- Pauli Principle
- band structure
- metals, semiconductors and isolators
- p-n junction / diode

## 3) Optics

- quantum mechanical principles of the laser
- linear optics
- non-linear optics

Exercises (2142891, 2 SWS) are used for complementing and deepening the contents of the lecture as well as for answering more extensive questions raised by the students and for testing progress in learning of the topics.

## The student

- has the basic understanding of the physical foundations to explain the relationship between the quantum mechanical principles and the optical as well as electrical properties of materials
- can describe the fundamental experiments, which allow the illustration of these principles

regular attendance: 22,5 hours (lecture) and 22,5 hours (exercises 2142891)

self-study: 97,5 hours and 49 hours (exercises 2142891)

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

**Literature**

- Tipler und Mosca: Physik für Wissenschaftler und Ingenieure, Elsevier, 2004
- Haken und Wolf: Atom- und Quantenphysik. Einführung in die experimentellen und theoretischen Grundlagen, 7. Aufl., Springer, 2000
- Harris, Moderne Physik, Pearson Verlag, 2013

## T

## 6.158 Course: Platform Economy [T-WIWI-109936]

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

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

**Part of:** [M-WIWI-101421 - Supply Chain Management](#)  
[M-WIWI-101434 - eBusiness and Service Management](#)  
[M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)  
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each winter term	3

Events					
WS 19/20	2540468	<a href="#">Platform Economy</a>	2 SWS	Lecture (V)	Weinhardt, Dann
WS 19/20	2540469	<a href="#">Übung zu Platform Economy</a>	SWS	Practice (Ü)	Dann, Richter
Exams					
WS 19/20	7900213	<a href="#">Platform Economy</a>		Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. Details of the grades will be announced at the beginning of the course.

**Prerequisites**

see below

**Recommendation**

None

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

## V

**Platform Economy**

2540468, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Literature**

- Bundesministerium für Wirtschaft und Energie (2017). „Kompetenzen für eine digitale Souveränität“ (abrufbar unter <https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/kompetenzen-fuer-eine-digitale-souveraenitaet.html>)
- Bundesministerium für Wirtschaft und Energie (2017). „Weißbuch Digitale Plattformen.“ (abrufbar unter [https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?\\_\\_blob=publicationFile&v=8](https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?__blob=publicationFile&v=8))
- Chuen, D.L.K., ed. 2015. “Handbook of digital currency: Bitcoin, innovation, financial instruments, and big data,” Academic Press.
- Easley, D., and Kleinberg, J. 2010. “Network Effects,” in Networks, Crowds, and Markets: Reasoning about a Highly Connected World, Cambridge University Press, pp. 509–542.
- Eisenmann, T., Parker, G., and Van Alstyne, M. W. 2006. “Strategies for two-sided markets,” Harvard Business Review 84(10), pp. 1–11.
- Gassmann, O., Frankenberger, K., and Csik, M. 2013. Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator, Hanser.
- Wattenhofer, R. 2016. “The science of the blockchain.” CreateSpace Independent Publishing Platform.
- Roth, A. 2002. “The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics,” Econometrica 70(4): 1341-1378, 2002.
- Weinhardt, C., Holtmann, C., Neumann, D., Market Engineering. Wirtschaftsinformatik, 2003.
- Wolfstetter, E., 1999. “Topics in Microeconomics - Industrial Organization, Auctions, and Incentives,” Cambridge, Cambridge University Press.
- Teubner, T., and Hawlitschek, F. (in press). “The economics of P2P online sharing,” in The Sharing Economy: Possibilities, Challenges, and the way forward, Praeger Publishing.

T

**6.159 Course: PLM for Product Development in Mechatronics [T-MACH-102181]****Responsible:** Prof. Dr.-Ing. Martin Eigner**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
WS 19/20	2122376	<a href="#">PLM for product development in mechatronics</a>	SWS	Lecture (V)	Eigner
SS 2020	2122376	<a href="#">PLM for product development in mechatronics</a>	SWS	Lecture (V)	Eigner
Exams					
WS 19/20	76-T-MACH-102181	<a href="#">PLM for Product Development in Mechatronics</a>		Prüfung (PR)	Eigner

**Competence Certificate**

Oral examination 20 min.

**Prerequisites**

none

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

V

**PLM for product development in mechatronics**2122376, WS 19/20, SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Students are able to

- compare product data management and product lifecycle management.
- describe the components and core functions of a PLM solution
- explain trends from research and practice in the field of PLM form mechatronic product development

**Literature**

Vorlesungsfolien / lecture slides

V

**PLM for product development in mechatronics**2122376, SS 2020, SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

Students are able to

- compare product data management and product lifecycle management.
- describe the components and core functions of a PLM solution
- explain trends from research and practice in the field of PLM form mechatronic product development

**Literature**

Vorlesungsfolien / lecture slides

T

**6.160 Course: PLM-CAD Workshop [T-MACH-102153]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

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

Events					
WS 19/20	2121357	<a href="#">PLM-CAD Workshop</a>	4 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
SS 2020	2121357	<a href="#">PLM-CAD Workshop</a>	4 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
Exams					
WS 19/20	76-T-MACH-102153	<a href="#">PLM-CAD Workshop</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**

Alternative exam assessment (graded)

**Prerequisites**

None

**Annotation**

Number of participants is limited, compulsory attendance

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

V

**PLM-CAD Workshop**2121357, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)**Project (PRO)****Content**

The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.

Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

**Literature**

Workshop-Unterlagen / workshop materials

V

**PLM-CAD Workshop**2121357, SS 2020, 4 SWS, Language: German, [Open in study portal](#)**Project (PRO)****Content**

The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.

Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

**Literature**

Workshop-Unterlagen / workshop materials

T

**6.161 Course: Power Network [T-ETIT-100830]**

**Responsible:** Prof. Dr.-Ing. Thomas Leibfried  
**Organisation:** KIT Department of Electrical Engineering and Information Technology  
**Part of:** [M-ETIT-102379 - Power Network](#)

Type	Credits	Recurrence	Version
Written examination	6	Each winter term	1

Events					
WS 19/20	2307371	<a href="#">Power Network</a>	2 SWS	Lecture (V)	Leibfried
WS 19/20	2307373	<a href="#">Tutorial for 2307371 Power Network</a>	2 SWS	Practice (Ü)	Hirsching, Leibfried
Exams					
WS 19/20	7307371	<a href="#">Power Network</a>		Prüfung (PR)	Leibfried



T

**6.162 Course: Practical Seminar Interaction [T-WIWI-109935]**

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

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

**Part of:** [M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)

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

Events					
WS 19/20	2540555	<a href="#">Practical Seminar: Digital Services (Ba)</a>	3 SWS	Lecture (V)	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.

T

**6.163 Course: Practical Seminar Platforms [T-WIWI-109937]**

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

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

**Part of:** [M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

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

**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.

T

**6.164 Course: Practical Seminar Servitization [T-WIWI-109939]**

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

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

**Part of:** [M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

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

T

**6.165 Course: Practical Seminar: Digital Services [T-WIWI-110888]**

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

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

**Part of:** [M-WIWI-102752 - Fundamentals of Digital Service Systems](#)

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

Events					
WS 19/20	2540555	<a href="#">Practical Seminar: Digital Services (Ba)</a>	3 SWS	Lecture (V)	Mädche

**Competence Certificate**

The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

**Prerequisites**

None

**Recommendation**

None

**Annotation**

The current range of seminar topics is announced on the KSRI website [www.ksri.kit.edu](http://www.ksri.kit.edu).

T

## 6.166 Course: Practical Training in Basics of Microsystem Technology [T-MACH-102164]

**Responsible:** Dr. Arndt Last

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

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

Events					
WS 19/20	2143875	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course (P)	Last
WS 19/20	2143877	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course (P)	Last
SS 2020	2143875	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course (P)	Last
SS 2020	2143877	<a href="#">Introduction to Microsystem Technology - Practical Course</a>	2 SWS	Practical course (P)	Last
Exams					
WS 19/20	76-T-MACH-102164	<a href="#">Practical Training in Basics of Microsystem Technology</a>		Prüfung (PR)	Last
SS 2020	76-T-MACH-102164	<a href="#">Practical Training in Basics of Microsystem Technology</a>		Prüfung (PR)	Last

### Competence Certificate

The assessment consists of a written exam

### Prerequisites

none

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

V

### Introduction to Microsystem Technology - Practical Course

2143875, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

### Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

V

### Introduction to Microsystem Technology - Practical Course

2143877, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

### Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

V

### Introduction to Microsystem Technology - Practical Course

2143875, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

**Content**

In the practical training includes nine experiments:

1. Hot embossing of plastics micro structures
2. Micro electroforming
3. Mikro optics: "LIGA-micro spectrometer"
4. UV-lithography
5. Optical waveguides
6. Capillary electrophoresis on a chip
7. SAW gas sensor
8. Metrology
9. Atomic force microscopy

Each student takes part in only five experiments.

The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
 Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**

2143877, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

**Content**

In the practical training includes nine experiments:

1. Hot embossing of plastics micro structures
2. Micro electroforming
3. Mikro optics: "LIGA-micro spectrometer"
4. UV-lithography
5. Optical waveguides
6. Capillary electrophoresis on a chip
7. SAW gas sensor
8. Metrology
9. Atomic force microscopy

Each student takes part in only five experiments.

The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

**Literature**

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997  
 Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

T

## 6.167 Course: Problem Solving, Communication and Leadership [T-WIWI-102871]

**Responsible:** Prof. Dr. Hagen Lindstädt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101425 - Strategy and Organization](#)  
[M-WIWI-101513 - Human Resources and Organizations](#)

Type	Credits	Recurrence	Version
Written examination	2	Each summer term	1

Events					
WS 19/20	2577910	<a href="#">Problem solving, communication and leadership</a>	1 SWS	Lecture (V)	Lindstädt
SS 2020	2577910	<a href="#">Problem solving, communication and leadership</a>	1 SWS	Lecture (V)	Lindstädt
Exams					
WS 19/20	7900070	<a href="#">Problem Solving, Communication and Leadership</a>		Prüfung (PR)	Lindstädt

### Competence Certificate

The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

### Prerequisites

None

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

V

### Problem solving, communication and leadership

2577910, WS 19/20, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the prerequisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

### Learning Objectives:

After passing this course students are able to

- structure problem solving processes.
- apply the principles of focused communication based on charts and presentations.
- understand leadership in the context of situation and personality.

### Recommendations:

None.

### Workload:

The total workload for this course is approximately 60 hours. For further information see German version.

### Assessment:

The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

**Literature****Verpflichtende Literatur:**

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

**Ergänzende Literatur:**

- Hungenberg, Harlad: Problemlösung und Kommunikation, 3. Aufl. München 2010
- Zelazny, Gene; Delker, Christel: Wie aus zahlen Bilder werden, 6. Aufl. Wiesbaden 2008
- Minto, Barbara: Das Prinzip der Pyramide: Ideen klar, verständlich und erfolgreich kommunizieren. 2005

**Problem solving, communication and leadership**

2577910, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

**Lecture (V)****Literature****Verpflichtende Literatur:**

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

**Ergänzende Literatur:**

- Hungenberg, Harlad: Problemlösung und Kommunikation, 3. Aufl. München 2010
- Zelazny, Gene; Delker, Christel: Wie aus zahlen Bilder werden, 6. Aufl. Wiesbaden 2008
- Minto, Barbara: Das Prinzip der Pyramide: Ideen klar, verständlich und erfolgreich kommunizieren. 2005



T

**6.168 Course: Procedures of Remote Sensing [T-BGU-103542]**

**Responsible:** Dr.-Ing. Uwe Weidner  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Version
Oral examination	3	2

T

**6.169 Course: Procedures of Remote Sensing, Prerequisite [T-BGU-101638]****Responsible:** Dr.-Ing. Uwe Weidner**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Completed coursework	1	Each summer term	1

Events					
SS 2020	6020244	<a href="#">Fernerkundungsverfahren, Übung</a>	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2020	8284101638	<a href="#">Procedures of Remote Sensing, Prerequisite</a>		Prüfung (PR)	Weidner

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

T

## 6.170 Course: Product- and Production-Concepts for modern Automobiles [T-MACH-110318]

**Responsible:** Dr. Stefan Kienzle  
Dr. Dieter Steegmüller

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each winter term	1

Events					
WS 19/20	2149670	<a href="#">Product- and Production-Concepts for modern Automobiles</a>	2 SWS	Lecture (V)	Steegmüller, Kienzle
Exams					
WS 19/20	76-T-MACH-110318	<a href="#">Product- and Production-Concepts for modern Automobiles</a>		Prüfung (PR)	Steegmüller, Kienzle

### Competence Certificate

Oral Exam (20 min)

### Prerequisites

T-MACH-105166 - Materials and Processes for Body Lightweight Construction in the Automotive Industry must not have been started.

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

V

## Product- and Production-Concepts for modern Automobiles

2149670, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The lecture illuminates the practical challenges of modern automotive engineering. As former leaders of the automotive industry, the lecturers refer to current aspects of automotive product development and production.

The aim is to provide students with an overview of technological trends in the automotive industry. In this context, the course also focuses on changes in requirements due to new vehicle concepts, which may be caused by increased demands for individualisation, digitisation and sustainability. The challenges that arise in this context will be examined from both a production technology and product development perspective and will be illustrated with practical examples thanks to the many years of industrial experience of both lecturers.

The topics covered are:

- General conditions for vehicle and body development
- Integration of new drive technologies
- Functional requirements (crash safety etc.), also for electric vehicles
- Development Process at the Interface Product & Production, CAE/Simulation
- Energy storage and supply infrastructure
- Aluminium and lightweight steel construction
- FRP and hybrid parts
- Battery, fuel cell and electric motor production
- Joining technology in modern car bodies
- Modern factories and production processes, Industry 4.0.

**Learning Outcomes:**

The students ...

- are able to name the presented general conditions of vehicle development and are able to discuss their influences on the final product using practical examples.
- are able to name the various lightweight approaches and identify possible areas of application.
- are able to identify the different production processes for manufacturing lightweight structures and explain their functions.
- are able to perform a process selection based on the methods and their characteristics.

**Workload:**

regular attendance: 25 hours

self-study: 95 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

**6.171 Course: Product Lifecycle Management [T-MACH-105147]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	2

Events					
WS 19/20	2121350	<a href="#">Product Lifecycle Management</a>	2 SWS	Lecture (V)	Ovtcharova
Exams					
WS 19/20	76-T-MACH-105147	<a href="#">Product Lifecycle Management</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**

Written examination 90 min.

**Prerequisites**

None

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

V

**Product Lifecycle Management**2121350, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course includes:

- Basics for product data management and data exchange
- IT system solutions for Product Lifecycle Management (PLM)
- Economic viability analysis and implementation problems
- Illustrative scenario for PLM using the example of the institute's own I4.0Lab

After successful attendance of the course, students can:

- identify the challenges of data management and exchange and describe solution concepts for these challenges.
- clarify the management concept PLM and its goals and highlight the economic benefits.
- explain the processes required to support the product life cycle and describe the most important business software systems (PDM, ERP, ...) and their functions.

**Literature**

Vorlesungsfolien.

V. Arnold et al: Product Lifecycle Management beherrschen, Springer-Verlag, Heidelberg, 2005.

J. Stark: Product Lifecycle Management, 21st Century Paradigm for Product Realisation, Springer-Verlag, London, 2006.

A. W. Scheer et al: Prozessorientiertes Product Lifecycle Management, Springer-Verlag, Berlin, 2006.

J. Schöttner: Produktdatenmanagement in der Fertigungsindustrie, Hanser-Verlag, München, 1999.

M.Eigner, R. Stelzer: Produktdaten Management-Systeme, Springer-Verlag, Berlin, 2001.

G. Hartmann: Product Lifecycle Management with SAP, Galileo press, 2007.

K. Obermann: CAD/CAM/PLM-Handbuch, 2004.

T

## 6.172 Course: Product, Process and Resource Integration in the Automotive Industry [T-MACH-102155]

**Responsible:** Dr.-Ing. Sama Mbang

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	2

Events					
SS 2020	2123364	<a href="#">Product, Process and Resource Integration in the Automotive Industry</a>	2 SWS	Lecture (V)	Mbang

### Competence Certificate

Oral examination 20 min.

### Prerequisites

None

### Annotation

Limited number of participants.

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

V

## Product, Process and Resource Integration in the Automotive Industry

2123364, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

- Overview of product development in the automotive sector (process- and work cycle, IT-Systems)
- Integrated product models in the automotive industry (product, process and resource)
- New CAx modeling methods (intelligent feature technology, templates & functional modeling)
- Automation and knowledge-based mechanism for product design and production planning
- Product development in accordance with defined process and requirement (3D-master principle, tolerance models)
- Concurrent Engineering, shared working
- Enhanced concepts: the digital and virtual factory (application of virtual technologies and methods in the product development)

### Literature

Vorlesungsfolien

T

## 6.173 Course: Production Economics and Sustainability [T-WIWI-102820]

**Responsible:** Prof. Dr. Frank Schultmann  
Dr.-Ing. Rebekka Volk

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

**Part of:** [M-WIWI-101437 - Industrial Production I](#)

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

Events					
WS 19/20	2581960	<a href="#">Production Economics and Sustainability</a>	2 SWS	Lecture (V)	Volk
Exams					
WS 19/20	7981960	<a href="#">Production Economics and Sustainability</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.

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

V

### Production Economics and Sustainability

2581960, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

### Content

The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.

#### Topics:

- regulations related to materials and substances
- raw materials, reserves and their availabilities/lifetimes
- material and substance flow analysis (MFA/SFA)
- material related ecoprofiles, e.g. Carbon Footprint
- LCA
- resource efficiency
- emission abatement
- waste management and closed-loop recycling
- raw material oriented production systems
- environmental management (EMAS, ISO 14001, Ecoprofit), eco-controlling

### Literature

wird in der Veranstaltung bekannt gegeben

T

**6.174 Course: Project in Applied Remote Sensing [T-BGU-101814]**

**Responsible:** Prof. Dr.-Ing. Stefan Hinz  
Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Version
Completed coursework	1	1

Events					
SS 2020	6020245	<a href="#">Projektübung angewandte Fernerkundung</a>	2 SWS	Practice (Ü)	Assistenten, Hinz
Exams					
SS 2020	8284101814	<a href="#">Project in Applied Remote Sensing</a>		Prüfung (PR)	Weidner



T

**6.175 Course: Project Management [T-BGU-101675]**

**Responsible:** Prof. Dr.-Ing. Shervin Haghsheno  
**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences  
**Part of:** [M-BGU-101004 - Fundamentals of Construction](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	2

Events					
WS 19/20	6200106	<a href="#">Projektmanagement</a>	2 SWS	Lecture / Practice (VÜ)	Haghsheno, Schneider
Exams					
WS 19/20	8230101675	<a href="#">Project Management</a>		Prüfung (PR)	Haghsheno, Schneider

**Competence Certificate**  
written exam with 60 minutes

**Prerequisites**  
None

**Recommendation**  
None

**Annotation**  
None

T

**6.176 Course: Public Law I & II [T-INFO-110300]**

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101192 - Constitutional and Administrative Law](#)

Type	Credits	Recurrence	Version
Written examination	6	Each summer term	1

Events					
WS 19/20	24016	<a href="#">Öffentliches Recht I - Grundlagen</a>	2 SWS	Lecture (V)	Barczak
SS 2020	24520	<a href="#">Öffentliches Recht II - Öffentliches Wirtschaftsrecht</a>	2 SWS	Lecture (V)	Eichenhofer
Exams					
WS 19/20	7500138	<a href="#">Public Law I &amp; II</a>		Prüfung (PR)	Barczak
SS 2020	7500298	<a href="#">Public Law I &amp; II</a>		Prüfung (PR)	Eichenhofer

## T 6.177 Course: Public Media Law [T-INFO-101311]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24082	<a href="#">Public Media Law</a>	2 SWS	Lecture (V)	Kirchberg
Exams					
WS 19/20	7500062	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500058	<a href="#">Public Media Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.178 Course: Public Revenues [T-WIWI-102739]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101403 - Public Finance](#)  
[M-WIWI-101499 - Applied Microeconomics](#)  
[M-WIWI-101668 - Economic Policy I](#)

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

Events					
SS 2020	2560120	<a href="#">Public Revenues</a>	2 SWS	Lecture (V)	Wigger
SS 2020	2560121	<a href="#">Übung zu Öffentliche Einnahmen</a>	1 SWS	Practice (Ü)	Wigger

**Competence Certificate**

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

**Prerequisites**

None

**Recommendation**

Basic knowledge of Public Finance is required.

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

V

**Public Revenues**

2560120, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

**Learning goals:**

See German version.

**Workload:**

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

**Literature****Literatur:**

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4. Aufl., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I und Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2. Aufl., Springer

T

**6.179 Course: Public Sector Finance [T-WIWI-109590]**

**Responsible:** Prof. Dr. Berthold Wigger  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101403 - Public Finance](#)

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

Events					
WS 19/20	2560136		3 SWS	Lecture (V)	Wigger, Groh

**Competence Certificate**

The assessment consists of a written exam (60 min.).

**Prerequisites**

T-WIWI-107763 "Municipal Finance" must not be selected.

**Annotation**

Previous title until winter semester 2018/19 "Municipal Finance".

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

V

2560136, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course *Municipal Finance* addresses the theory and policy of municipal revenues and spending including grants, municipal revenue equalisation, taxation as well as municipal and public enterprises.

At the beginning of the course, fundamental concepts of taxation theory as well as key elements of the German taxation system are introduced. The allocative and distributive effects of different taxation methods are examined thereafter and are combined within the theory of optimal taxation. The following chapter is concerned with municipal borrowing and illustrates ways to acquire additional funding. After addressing the extent, structure and variety of municipal borrowing, macroeconomic theories are introduced and applied to the municipal sector. In the course of this final chapter, special attention will be paid to the long term consequences and the sustainability of municipal borrowing as a means of budgeting.

**Learning goals:**

The students:

- are familiar with the theory and policy of municipal revenues and spending.
- are able to evaluate the allocative and distributive effects of different kinds of municipal revenues and spending.
- understand the extent, structure and variety of municipal budgeting and are able to assess long term consequences of municipal revenues and spending.

**Workload:**

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

**Literature**

- Ade, K., Notheis, K. & Schmid, H. (2011). *Kommunales Wirtschaftsrecht in Baden Württemberg*. Boorberg-Verlag.
- Aker, B., Hafner, W. & Notheis, K. (2012). *Gemeindeordnung Baden-Württemberg(Kommentar)*. Boorberg-Verlag.
- Groh, M. (1994). Kommunalleasing und Investorenfinanzierung als Private Public Partnership. *Stadt und Gemeinde*, 49. Jahrgang, 09/94.
- Wigger, B. U. (2006). *Grundzüge der Finanzwissenschaft*. Springer-Verlag.
- Diverse Veröffentlichungen des Innenministeriums und Finanzministeriums Baden-Württemberg.

T

**6.180 Course: Python for Empirical Finance [T-WIWI-110217]**

**Responsible:** Prof. Dr Maxim Ulrich  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-105035 - Empirical Finance](#)

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

Events					
WS 19/20	2500014	<a href="#">Python for Empirical Finance</a>	2 SWS	Practical course (P)	Ulrich
Exams					
WS 19/20	00174	<a href="#">Python for Empirical Finance</a>		Prüfung (PR)	Ulrich

**Competence Certificate**

The assessment is carried out in form of six biweekly 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.

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

V

**Python for Empirical Finance**

2500014, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Practical course (P)****Content**

The aim of this course is to provide students with strong knowledge in Python to independently solve real-world data problems related to computational risk and asset management.

The course covers several topics from a programming perspective, among them:

Mean-Variance Portfolio Optimization

Modeling Distribution of Asset Returns with Factor Models and ARMA-GARCH

Monte-Carlo Simulation

Parameter Estimation with Maximum Likelihood and Regressions

The course introduces students to Python, one of the most popular high-level programming languages in data analytics. After an introduction to the basic concepts, students will soon begin to solve problems related to the agenda of the lecture 'Empirical Finance'. This enables them to work with financial data, perform various statistical analysis and estimate their own time series models.

T

**6.181 Course: Quality Management [T-MACH-102107]****Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

Type	Credits	Recurrence	Version
Written examination	4	Each winter term	1

Events					
WS 19/20	2149667	<a href="#">Quality Management</a>	2 SWS	Lecture (V)	Lanza
Exams					
WS 19/20	76-T-MACH-102107	<a href="#">Quality Management</a>		Prüfung (PR)	Lanza

**Competence Certificate**

Written Exam (60 min)

**Prerequisites**

none

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

V

**Quality Management**2149667, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**

**Content**

Based on the quality philosophies Total Quality Management (TQM) and Six Sigma, the lecture deals with the requirements of modern quality management. Within this context, the process concept of a modern enterprise and the process-specific fields of application of quality assurance methods are presented. The lecture covers the current state of the art in preventive and non-preventive quality management methods in addition to manufacturing metrology, statistical methods and service related quality management. The content is completed with the presentation of certification possibilities and legal quality aspects.

Main topics of the lecture:

- The term "Quality"
- Total Quality Management (TQM) and Six Sigma
- Universal methods and tools
- QM during early product stages – product definition
- QM during product development and in procurement
- QM in production – manufacturing metrology
- QM in production – statistical methods
- QM in service
- Quality management systems
- Legal aspects of QM

**Learning Outcomes:**

The students ...

- are capable to comment on the content covered by the lecture.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the lecture to new problems from the context of the lecture.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the lecture for a specific problem.

**Workload:**

regular attendance: 21 hours

self-study: 99 hours

**Literature****Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt:

**Media:**

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).



T

## 6.182 Course: Real Estate Management I [T-WIWI-102744]

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101466 - Real Estate Management](#)

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

Events					
WS 19/20	2586400	<a href="#">Real Estate Management I</a>	2 SWS	Lecture (V)	Lützkendorf, Worschech
WS 19/20	2586401	<a href="#">Übungen zu Real Estate Management I</a>	2 SWS	Practice (Ü)	Worschech
Exams					
WS 19/20	7900249	<a href="#">Real Estate Management I</a>		Prüfung (PR)	Lützkendorf

**Competence Certificate**

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

**Prerequisites**

None

**Annotation**

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

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

V

**Real Estate Management I**

2586400, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course Real Estate Management I deals with questions concerning the economy of a single building throughout its lifecycle. Among other topics this includes project development, location and market studies, German federal building codes as well as finance and assessment of economic efficiency.

The tutorial reassesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course Real Estate Management I deals with questions concerning the economy of a single building throughout its lifecycle. Among other topics this includes project development, location and market studies, German federal building codes as well as finance and assessment of economic efficiency.

The tutorial reassesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

**Recommendations:**

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

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

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

**Literature****Weiterführende Literatur:**

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T

## 6.183 Course: Real Estate Management II [T-WIWI-102745]

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101466 - Real Estate Management](#)

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

Events					
SS 2020	2585400	<a href="#">Real Estate Management II</a>	2 SWS	Lecture (V)	Lützkendorf, Worschech
SS 2020	2585401	<a href="#">Übung zu Real Estate Management II</a>	2 SWS	Practice (Ü)	Worschech

### Competence Certificate

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

### Prerequisites

None

### Recommendation

A combination with the module *Design Construction and Assessment of Green Buildings* is recommended. Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

### Annotation

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

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

V

### Real Estate Management II

2585400, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The course Real Estate Management II gives special attention to topics in connection to the management of large real estate portfolios. This especially includes property valuation, market and object rating, maintenance and modernization, as well as real estate portfolio and risk management. The tutorial provides examples in order to practice the application of theoretical knowledge to practical problems.

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

The student

- has an in-depth knowledge on the economic classification and significance of the real estate industry
- has a critical understanding of essential theories, methods and instruments of the real estate industry
- is able to analyze and evaluate activity areas and functions in real estate companies as well as to prepare or to take decisions

**Recommendations:**

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

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

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

**Literature****Weiterführende Literatur:**

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T

**6.184 Course: Remote Sensing, Exam [T-BGU-101636]**

**Responsible:** Prof. Dr.-Ing. Stefan Hinz  
Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2020	6020241	<a href="#">Fernerkundungssysteme</a>	1 SWS	Lecture (V)	Hinz
SS 2020	6020242	<a href="#">Fernerkundungssysteme, Übung</a>	1 SWS	Practice (Ü)	Weidner
SS 2020	6020243	<a href="#">Fernerkundungsverfahren</a>	2 SWS	Lecture (V)	Weidner
SS 2020	6020244	<a href="#">Fernerkundungsverfahren, Übung</a>	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2020	8284101636	<a href="#">Remote Sensing, exam</a>		Prüfung (PR)	Weidner, Hinz

**Recommendation**

None

T

## 6.185 Course: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]

**Responsible:** PD Dr. Patrick Jochem  
Prof. Dr. Russell McKenna

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

**Part of:** [M-WIWI-101464 - Energy Economics](#)

Type	Credits	Recurrence	Version
Written examination	3,5	Each winter term	3

Events					
WS 19/20	2581012	<a href="#">Renewable Energy – Resources, Technologies and Economics</a>	2 SWS	Lecture (V)	McKenna, Jochem
Exams					
WS 19/20	7981012	<a href="#">Renewable Energy-Resources, Technologies and Economics</a>		Prüfung (PR)	Fichtner

### Competence Certificate

The assessment consists of a written exam (60 min., in English, answers in English or German).

### Prerequisites

None.

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

V

## Renewable Energy – Resources, Technologies and Economics

2581012, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

### Content

1. General introduction: Motivation, Global situation
2. Basics of renewable energies: Energy balance of the earth, potential definition
3. Hydro
4. Wind
5. Solar
6. Biomass
7. Geothermal
8. Other renewable energies
9. Promotion of renewable energies
10. Interactions in systemic context
11. Excursion to the "Energieberg" in Mühlburg

### Learning Goals:

#### The student

- understands the motivation and the global context of renewable energy resources.
- gains detailed knowledge about the different renewable resources and technologies as well as their potentials.
- understands the systemic context and interactions resulting from the increased share of renewable power generation.
- understands the important economic aspects of renewable energies, including electricity generation costs, political promotion and marketing of renewable electricity.
- is able to characterize and where required calculate these technologies.

**Literature****Weiterführende Literatur:**

- Kaltschmitt, M., 2006, Erneuerbare Energien : Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, aktualisierte, korrigierte und ergänzte Auflage Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.
- Kaltschmitt, M., Streicher, W., Wiese, A. (eds.), 2007, Renewable Energy: Technology, Economics and Environment, Springer, Heidelberg.
- Quaschnig, V., 2010, Erneuerbare Energien und Klimaschutz : Hintergründe - Techniken - Anlagenplanung - Wirtschaftlichkeit München : Hanser, Ill.2., aktualis. Aufl.
- Harvey, D., 2010, Energy and the New Reality 2: Carbon-Free Energy Supply, Earthscan, London/Washington.
- Boyle, G. (ed.), 2004, Renewable Energy: Power for a Sustainable Future, 2nd Edition, Open University Press, Oxford.

T

**6.186 Course: Selected Legal Issues of Internet Law [T-INFO-108462]**

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

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

Events					
SS 2020	24821	<a href="#">Selected legal issues of Internet law</a>	2 SWS	Colloquium (KOL)	Dreier
Exams					
SS 2020	7500226	<a href="#">Selected legal issues of Internet law</a>		Prüfung (PR)	Dreier



T

**6.187 Course: Selected Topics on Optics and Microoptics for Mechanical Engineers [T-MACH-102165]**

**Responsible:** Mathias Hecke  
Dr.-Ing. Timo Mappes

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-MACH-101287 - Microsystem Technology](#)

Type	Credits	Recurrence	Version
Oral examination	3	Each term	1

**Competence Certificate**

Oral examination

**Prerequisites**

none

T

**6.188 Course: Seminar Data-Mining in Production [T-MACH-108737]**

**Responsible:** Prof. Dr.-Ing. Gisela Lanza  
**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	2151643	<a href="#">Seminar Data Mining in Production</a>	2 SWS	Seminar (S)	Lanza
SS 2020	2151643	<a href="#">Seminar Data Mining in Production</a>	2 SWS	Seminar (S)	Lanza
Exams					
WS 19/20	76-T-MACH-108737	<a href="#">Seminar Data-Mining in Production</a>		Prüfung (PR)	Lanza

**Competence Certificate**

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

**Prerequisites**

none

**Annotation**

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at <https://www.wbk.kit.edu/studium-und-lehre.php>.

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

V

**Seminar Data Mining in Production**

2151643, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

**Learning Outcomes:**

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

**Workload:**

regular attendance: 10 hours  
self-study: 80 hours

**Literature****Medien:**

KNIME Analytics Platform

**Media:**

KNIME Analytics Platform

**Seminar Data Mining in Production**

2151643, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Content**

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

**Learning Outcomes:**

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

**Workload:**

regular attendance: 10 hours  
self-study: 80 hours

**Literature****Medien:**

KNIME Analytics Platform

**Media:**

KNIME Analytics Platform

## T

## 6.189 Course: Seminar in Business Administration (Bachelor) [T-WIWI-103486]

**Responsible:** Professorenschaft des Fachbereichs Betriebswirtschaftslehre

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

**Part of:** M-WIWI-101816 - Seminar Module

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

Events					
WS 19/20	2500028	Seminar in Empirical Finance	2 SWS	Seminar (S)	Ulrich
WS 19/20	2530580	Seminar in Finance	2 SWS	Seminar (S)	Uhrig-Homburg, Mitarbeiter
WS 19/20	2540473	Data Science in Service Management	2 SWS	Seminar (S)	Haubner, Frankenhauser, Gröschel
WS 19/20	2540475	Electronic Markets & User behavior	2 SWS	Seminar (S)	Dorner, Knierim, Dann, Jaquart
WS 19/20	2540477	Digital Experience and Participation	2 SWS	Seminar (S)	Straub, Peukert, Hoffmann, Kloker, Pasmaz, Willrich, Kloepper, Fegert, Greif-Winzrieth
WS 19/20	2540478	Smart Grids and Energy Markets	2 SWS	Seminar (S)	Dinther, Staudt, Richter, Huber, vom Scheidt, Golla, Schmidt
WS 19/20	2540524	Bachelor Seminar aus Data Science	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	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar (S)	Terzidis, Ziegler, González
WS 19/20	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar (S)	Böhrer, Terzidis
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	2579919	Seminar Management Accounting - Special Topics	2 SWS	Seminar (S)	Riar
WS 19/20	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar (S)	Glöser-Chahoud, Schultmann
WS 19/20	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar (S)	Volk, Schultmann
WS 19/20	2581978	Seminar in Production and Operations Management III	2 SWS	Seminar (S)	Wiens, Schultmann
WS 19/20	2581980		2 SWS	Seminar (S)	Keles, Fett, Yilmaz
WS 19/20	2581981		2 SWS	Seminar (S)	Ardone, Ruppert, Sandmeier, Slednev
WS 19/20	2581990		2 SWS	Seminar (S)	Schultmann, Schumacher
SS 2020	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar (S)	Ruckes, Luedecke, Hoang, Benz, Schubert, Strych, Silbereis

SS 2020	2530374	Data-Driven Investments	2 SWS	Seminar (S)	Ulrich
SS 2020	2530580	Seminar in Finance	2 SWS	Seminar (S)	Uhrig-Homburg, Eska, Schuster, Eberbach, Reichenbacher
SS 2020	2540524	Bachelorseminar aus Data Science	2 SWS	Seminar (S)	Geyer-Schulz, Schweigert, Schweizer
SS 2020	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar (S)	Lau, Terzidis
SS 2020	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar (S)	Terzidis, Böhrer
SS 2020	2571180	Seminar in Marketing und Vertrieb (Bachelor)	2 SWS	Seminar (S)	Klarmann, Mitarbeiter, Feurer
SS 2020	2571181	Seminar in Marketing und Vertrieb (Master)	2 SWS	Seminar (S)	Klarmann, Mitarbeiter, Feurer
SS 2020	2573010	Seminar Human Resources and Organizations (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2020	2573011	Seminar Human Resource Management (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2020	2579909	Seminar Management Accounting	2 SWS	Seminar (S)	Wouters, Hammann, Disch
SS 2020	2579919	Seminar in Management Accounting - Special Topics	2 SWS	Seminar (S)	Wouters, Ebinger
SS 2020	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar (S)	Volk, Schultmann
SS 2020	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar (S)	Keles
SS 2020	2581990		2 SWS	Seminar (S)	Schultmann, Schumacher, Baumgartner
<b>Exams</b>					
WS 19/20	7900017	Seminar Smart Grid and Energy Markets		Prüfung (PR)	Weinhardt
WS 19/20	7900085	Entrepreneurship Basics (Track 1)		Prüfung (PR)	Terzidis
WS 19/20	7900087	Entrepreneurship Basics (Track 2)		Prüfung (PR)	Terzidis
WS 19/20	7900157	Seminar Human Resources and Organizations (Bachelor)		Prüfung (PR)	Nieken
WS 19/20	7900161	Seminar Human Resource Management (Bachelor)		Prüfung (PR)	Nieken
WS 19/20	7900165	Seminar Digital Experience and Participation		Prüfung (PR)	Weinhardt
WS 19/20	7900168	Bachelor Seminar in Data Science		Prüfung (PR)	Geyer-Schulz
WS 19/20	7900175	Seminar in Finance (Bachelor)		Prüfung (PR)	Uhrig-Homburg
WS 19/20	7900203	Seminar in Finance		Prüfung (PR)	Uhrig-Homburg
WS 19/20	7900233	Literature Review Seminar: Information Systems and Service Design (Seminar)		Prüfung (PR)	Mädche
WS 19/20	7900250	Seminar Strategic Management (Bachelor)		Prüfung (PR)	Lindstädt
WS 19/20	7900327	Electronic Markets & User behavior (Seminar)		Prüfung (PR)	Weinhardt
WS 19/20	7900329	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Ulrich
WS 19/20	79-2579919-B	Seminar Management Accounting - Special Topics (Bachelor)		Prüfung (PR)	Wouters
WS 19/20	7981976	Seminar in Production and Operations Management I		Prüfung (PR)	Schultmann
WS 19/20	7981977	Seminar in Production and Operations Management II		Prüfung (PR)	Schultmann
WS 19/20	7981978	Seminar in Production and Operations Management III		Prüfung (PR)	Schultmann
WS 19/20	7981979	Seminar in Business Administration A (Master)		Prüfung (PR)	Fichtner
WS 19/20	7981980	Seminar in Business Administration A (Master)		Prüfung (PR)	Fichtner
WS 19/20	7981981	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Fichtner
SS 2020	7900093	Seminar in Business Administration A		Prüfung (PR)	Weinhardt

SS 2020	7900220	<a href="#">Seminar in Business Administration (Bachelor)</a>	Prüfung (PR)	Ulrich
SS 2020	7981976	<a href="#">Seminar in Production and Operations Management I</a>	Prüfung (PR)	Schultmann
SS 2020	7981977	<a href="#">Seminar in Production and Operations Management II</a>	Prüfung (PR)	Schultmann
SS 2020	7981978	<a href="#">Seminar in Production and Operations Management III</a>	Prüfung (PR)	Schultmann
SS 2020	7981980	<a href="#">Seminar Energy Economics II</a>	Prüfung (PR)	Fichtner
SS 2020	7981981	<a href="#">Seminar Energy Economics III</a>	Prüfung (PR)	Fichtner

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

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

	<b>Seminar in Empirical Finance</b> 2500028, WS 19/20, 2 SWS, Language: English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b>
	<b>Data Science in Service Management</b> 2540473, WS 19/20, 2 SWS, Language: German/English, <a href="#">Open in study portal</a>	<b>Seminar (S)</b>
<b>Content</b> wird auf deutsch und englisch gehalten		
	<b>Bachelor Seminar aus Data Science</b> 2540524, WS 19/20, 2 SWS, Language: German, <a href="#">Open in study portal</a>	<b>Seminar (S)</b>

### Literature

#### Weiterführende Literatur:

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

**Entrepreneurship Basics (Track 1)**2545010, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

**Entrepreneurship Basics (Track 2)**2545011, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

):

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

**Seminar: Human Resources and Organizations (Bachelor)**2573010, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Seminar: Human Resource Management (Bachelor)**

2573011, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Seminar Management Accounting - Special Topics**

2579919, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)



**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscbed. The seminar course is concentrated in several meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**Workload:**

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

**Note:**

- Maximum of 16 students.

**Literature**

Will be announced in the course.

**Data-Driven Investments**

2530374, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

The digitalization is not only changing today's society but also companies' business models, in particular of the financial industry. In general, the large variety of digitalized processes and connected devices (Industry 4.0) generates a huge amount of data which can be used to extract valuable (investment) insights. For this task data science skills are essential.

In this seminar we will use modern data science techniques to analyze all kinds of financial and economic data, ranging from big data intra-day option prices to alternative datasets, like textual statements. For this empirical analysis we will use the state of the art Python programming language.

In a bi-weekly schedule you and your supervisor will first learn and discuss important data science concepts and then apply it in a practical FinTech-type analysis using real-world data. As a prerequisite students should already have basic finance knowledge.

**Seminar in Finance**

2530580, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Literature**

Wird jeweils am Ende des vorherigen Semesters bekanntgegeben.

**Seminar Human Resources and Organizations (Bachelor)**

2573010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Seminar Human Resource Management (Bachelor)**

2573011, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

**Aim**

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

**Workload**

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

**Literature**

Selected journal articles and books.

**Seminar Management Accounting**

2579909, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Workload:**

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

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**Note:**

- Maximum of 16 students.

**Literature**

Will be announced in the course.

**Seminar in Management Accounting - Special Topics**

2579919, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Content**

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

**Learning objectives:**

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

**Workload:**

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

**Examination:**

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

**Required prior Courses:**

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

**Note:**

- Maximum of 16 students.

**Literature**

Will be announced in the course.

## T

## 6.190 Course: Seminar in Economics (Bachelor) [T-WIWI-103487]

**Responsible:** Professorenschaft des Fachbereichs Volkswirtschaftslehre

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

**Part of:** M-WIWI-101816 - Seminar Module

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

Events					
WS 19/20	2521310	Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görden
WS 19/20	2560140	Topics in Political Economy (Bachelor)	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2560141	Morals & Social Behavior (Bachelor & Master)	2 SWS	Seminar (S)	Huber, Ehrlich
WS 19/20	2560142	Topics in Political Economy (Master)	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2561208	Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung	1 SWS	Seminar (S)	Szimba
SS 2020	2560241	Digital IT Solutions and Services transforming the Field of Public Transportation	2 SWS	Prüfung (PR)	Janoshalmi
SS 2020	2560555	Fighting Climate Change, Seminar on Morals and Social Behavior (Master)	2 SWS	Seminar (S)	Szech, Zhao
SS 2020	2560556	Designing the Digital Economy, Topics on Political Economy (Bachelor)	2 SWS	Seminar (S)	Szech, Huber
SS 2020	2560557	Designing the Digital Economy, Topics on Political Economy (Master)	2 SWS	Seminar (S)	Szech, Huber
Exams					
WS 19/20	7900124	Seminar in Economics (Bachelor)		Prüfung (PR)	Szech, Puppe
WS 19/20	7900132	Seminar in Economics A (Master)		Prüfung (PR)	Fuchs-Seliger
WS 19/20	7900139	Seminar in Economics (Bachelor/Master)		Prüfung (PR)	Mitusch
WS 19/20	7900205	Seminar in Macroeconomics I		Prüfung (PR)	Scheffel
WS 19/20	7900221	Topics in Experimental Economics		Prüfung (PR)	Reiß
WS 19/20	7900255	Seminar in Macroeconomics II		Prüfung (PR)	Scheffel
WS 19/20	7900278	Seminar on Morals and Social Behavior		Prüfung (PR)	Szech, Puppe
WS 19/20	7900281	Seminar in Economics B (Master), Seminar in Economics A (Bachelor)		Prüfung (PR)	Mitusch
WS 19/20	79sefi1	Seminar in Economics (Bachelor)		Prüfung (PR)	Wigger
SS 2020	7900036	Seminar in Macroeconomics I		Prüfung (PR)	Scheffel

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

**Prerequisites**

None.

**Recommendation**

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

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

**Topics in Econometrics**

2521310, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)**

**Topics in Political Economy (Bachelor)**

2560140, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students grades will be based on the quality of presentations in the seminar (50%) and the seminar paper (50%). Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Morals & Social Behavior (Bachelor & Master)**

2560141, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students grades will be based on the quality of presentations in the seminar (50%) and the seminar paper (50%).

For Master students, grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally Master students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade.

Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Topics in Political Economy (Master)**

2560142, WS 19/20, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)**

**Content**

For Master students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

For Master students, grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade. Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Fighting Climate Change, Seminar on Morals and Social Behavior (Master)**

Seminar (S)

2560555, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

The acceptance of students for the seminar is based on preferences and suitability for the topics. This includes theoretical and practical experience with Behavioral Economics as well as English skills.

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students grades will be based on the quality of presentations in the seminar (50%) and the seminar paper (50%). Students can improve their grades by actively participation in the discussion.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Designing the Digital Economy, Topics on Political Economy (Bachelor)**

Seminar (S)

2560556, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Designing the Digital Economy, Topics on Political Economy (Master)**

Seminar (S)

2560557, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

## T

**6.191 Course: Seminar in Engineering Science Master (approval) [T-WIWI-108763]****Responsible:** Fachvertreter ingenieurwissenschaftlicher Fakultäten**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>	SWS	Seminar (S)	Furmans, Pagani
SS 2020	2119100	<a href="#">Fördertechnik und Logistiksysteme</a>	SWS	Seminar (S)	Furmans, Pagani
Exams					
WS 19/20	76-T-MACH-00002	<a href="#">Seminar for Rail System Technology</a>	Prüfung (PR)		Gratzfeld
WS 19/20	76-T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>	Prüfung (PR)		Furmans
WS 19/20	8245100014	<a href="#">Seminar in Transportation</a>	Prüfung (PR)		Vortisch, Chlond
SS 2020	76-T-MACH-00002	<a href="#">Seminar for Rail System Technology</a>	Prüfung (PR)		Gratzfeld
SS 2020	76-T-MACH-102135	<a href="#">Conveying Technology and Logistics</a>	Prüfung (PR)		Furmans

**Competence Certificate**

See German version.

**Prerequisites**

See module description.

**Recommendation**

None

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

## V

**Fördertechnik und Logistiksysteme**2119100, SS 2020, SWS, [Open in study portal](#)**Seminar (S)****Content**

The goal of the seminar is to deal with different topics related to the materials handling and logistics. The students can work on the topic either alone or in a group work. At the end the results are presented and discussed with a final presentation. The prepare the work for the seminar an introductory event is scheduled at the beginning.



## T

## 6.192 Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]

**Responsible:** Professorenschaft des Fachbereichs Informatik

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

**Part of:** M-WIWI-101816 - Seminar Module

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

Events					
WS 19/20	2512301	Linked Data and the Semantic Web	3 SWS		Sure-Vetter, Acosta Deibe, Käfer, Heling
WS 19/20	2512311	Real-World Challenges in Data Science and Analytics	3 SWS		Sure-Vetter, Nickel, Weinhardt, Zehnder, Brandt
WS 19/20	2513200	Seminar Business Information Systems: Programming 3 (Bachelor)	2 SWS	Seminar (S)	Oberweis, Zöllner, Fritsch, Frister, Struppek
WS 19/20	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar (S)	Zöllner
WS 19/20	2595470	Seminar Service Science, Management & Engineering	3 SWS	Seminar (S)	Weinhardt, Satzger, Nickel, Fromm, Fichtner, Sure-Vetter
SS 2020	2513212	Seminar Business Information Systems: Artificial Intelligence and Robotic Process Automation (Bachelor)	2 SWS	Seminar (S)	Oberweis, Alpers, Goranov
SS 2020	2513308	Seminar Knowledge Discovery and Data Mining (Bachelor)	3 SWS	Seminar (S)	Sure-Vetter, Färber, Nguyen, Nouillet, Saier
SS 2020	2513310	Seminar Data Science & Real-time Big Data Analytics (Bachelor)	2 SWS	Seminar (S)	Sure-Vetter, Riemer, Zehnder
SS 2020	2513402	Emerging Trends in Internet Technologies (Bachelor)	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513404	Emerging Trends in Digital Health (Bachelor)	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2020	2513500	Cognitive Automobiles and Robots	2 SWS	Seminar (S)	Zöllner
SS 2020	2513554	Seminar Security, Usability and Society (Bachelor)	2 SWS	Seminar (S)	Volkamer, Aldag, Reinheimer
SS 2020	2595470	Seminar Service Science, Management & Engineering	2 SWS	Seminar (S)	Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm
Exams					
WS 19/20	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 19/20	7900042	Seminar Betriebliche Informationssysteme: Programmieren 3		Prüfung (PR)	Oberweis
WS 19/20	7900044	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter
WS 19/20	7900119	Cognitive automobiles and robots		Prüfung (PR)	Zöllner
WS 19/20	7900129	Security and Privacy Awareness		Prüfung (PR)	Volkamer
WS 19/20	7900187	Real-World Challenges in Data Science und Analytics		Prüfung (PR)	Sure-Vetter
SS 2020	7900090	Seminar Data Science & Real-time Big Data Analytics (Bachelor)		Prüfung (PR)	Sure-Vetter
SS 2020	7900092	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter

SS 2020	7900094	<a href="#">Seminar Knowledge Discovery and Data Mining (Bachelor)</a>	Prüfung (PR)	Sure-Vetter
SS 2020	7900136	<a href="#">Emerging Trends in Digital Health (Bachelor)</a>	Prüfung (PR)	Sunyaev
SS 2020	7900187	<a href="#">Emerging Trends in Internet Technologies (Bachelor)</a>	Prüfung (PR)	Sunyaev
SS 2020	7900194	<a href="#">Seminar Mathematics</a>	Prüfung (PR)	Volkamer
SS 2020	7900197	<a href="#">Seminar Business Information Systems: Artificial Intelligence and Robotic Process Automation (Bachelor)</a>	Prüfung (PR)	Oberweis
SS 2020	7900217	<a href="#">Seminar Security, Usability and Society (Bachelor)</a>	Prüfung (PR)	Volkamer

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

Placeholder for seminars offered by the Institute AIFB. 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:*



### Linked Data and the Semantic Web

2512301, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Content**

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this practical seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this practical seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

**Real-World Challenges in Data Science and Analytics**

2512311, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)

**Content**

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.

**Seminar Business Information Systems: Programming 3 (Bachelor)**

2513200, WS 19/20, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**

Registration information and the content of the seminar will be announced on the course page. Only bachelor students are allowed to attend this seminar.

**Cognitive Automobiles and Robots**

2513500, WS 19/20, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

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

**Learning objectives:**

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

**Recommendations:**

Attendance of the lecture machine learning

**Workload:**

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

**Seminar Service Science, Management & Engineering**

2595470, WS 19/20, 3 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: [www.ksri.kit.edu](http://www.ksri.kit.edu)

The assessment of this course is according to §4(2), 3 SPO in form of an examination of the written seminar thesis (15-20 pages), a presentation and active participation in class.

The final mark is based on the examination of the written seminar thesis but can be upgraded or downgraded according to the quality of the presentation.

**Learning objectives:**

The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

**Recommendations:**

Lecture *eServices* [2595466] is recommended.

**Workload:**

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

**Literature**

Die Basisliteratur wird entsprechend der zu bearbeitenden Themen bereitgestellt.

**Seminar Knowledge Discovery and Data Mining (Bachelor)**

2513308, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

In this seminar different machine learning and data mining methods are implemented.

The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

The exact dates and information for registration will be announced at the event page.

**Literature**

Detaillierte Referenzen werden zusammen mit den jeweiligen Themen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B. aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

**Seminar Data Science & Real-time Big Data Analytics (Bachelor)**

2513310, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

**Content**

In this practical seminar, students will design applications in teams that use meaningful and creative Event Processing methods. Thereby, students have access to an existing record.

Event processing and real-time data are everywhere: financial market data, sensors, business intelligence, social media analytics, logistics. Many applications collect large volumes of data in real time and are increasingly faced with the challenge of being able to process them quickly and react promptly. The challenges of this real-time processing are currently also receiving a great deal of attention under the term "Big Data". The complex processing of real-time data requires both knowledge of methods for data analysis (data science) and their processing (real-time analytics). Seminar papers are offered on both of these areas as well as on interface topics, the input of own ideas is explicitly desired.

Further information to the practical seminar is given under the following Link:

<http://seminar-cep.fzi.de>

Questions are answered via the e-mail address [sem-ep@fzi.de](mailto:sem-ep@fzi.de).

**Cognitive Automobiles and Robots**

2513500, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

**Content**

The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

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

**Learning objectives:**

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

**Recommendations:**

Attendance of the lecture machine learning

**Workload:**

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

**Seminar Security, Usability and Society (Bachelor)**

2513554, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content****Seminar:**

The main topic of this seminar is security, usability, and society. The goal is to analyze these topics from different perspectives. Always important is the human, as we are interested in how humans interact with certain problems and how it might be possible to tackle it. For instance, phishing detection, how is it possible to ensure a higher detection. To tackle this problem, you can either focus on the technical side, awareness training, regulations by organizations.

**Further important information:**

Because of the current situation, every meeting will be held online. This might change during the semester, depending on the course of the corona situation.

**Important dates:**

- Kick-Off 22.04
- Final submission 01.07
- Presentation 14.07

**Topics:**

Will be announced on the 30.03

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

**Seminar Service Science, Management & Engineering**

2595470, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)****Content**

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: [www.ksri.kit.edu](http://www.ksri.kit.edu)

**Learning objectives:**

The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

**Recommendations:**

Lecture *eServices* [2595466] is recommended.

**Workload:**

The total workload for this course is approximately 90 hours.

**Literature**

Die Basisliteratur wird entsprechend der zu bearbeitenden Themen bereitgestellt.

T

**6.193 Course: Seminar in Mathematics (Bachelor) [T-MATH-102265]**

**Responsible:** Dr. Martin Folkers  
Prof. Dr. Günter Last

**Organisation:** KIT Department of Mathematics

**Part of:** [M-WIWI-101816 - Seminar Module](#)

Type	Credits	Version
Examination of another type	3	1



## 6.194 Course: Seminar in Operations Research (Bachelor) [T-WIWI-103488]

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

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

**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	2550131	<a href="#">Seminar on Methodical Foundations of Operations Research</a>	2 SWS	Seminar (S)	Stein
WS 19/20	2550472	<a href="#">Seminar on Power Systems Optimization (Bachelor)</a>	2 SWS	Seminar (S)	Rebennack, Sinske
WS 19/20	2550491	<a href="#">Seminar: Modern OR and Innovative Logistics</a>	2 SWS	Seminar (S)	Nickel, Mitarbeiter
SS 2020	2550472	<a href="#">Seminar on Power Systems Optimization (Bachelor)</a>	2 SWS	Seminar (S)	Rebennack
SS 2020	2550491	<a href="#">Seminar: Modern OR and Innovative Logistics</a>	2 SWS	Seminar (S)	Nickel, Mitarbeiter
Exams					
WS 19/20	7900011_WS1920	<a href="#">Seminar in Operations Research B (Bachelor)</a>	Prüfung (PR)		Stein
WS 19/20	7900160	<a href="#">Modern OR and Innovative Logistics</a>	Prüfung (PR)		Nickel
WS 19/20	7900216	<a href="#">Real-World Challenges in Data Science und Analytics</a>	Prüfung (PR)		Nickel
WS 19/20	7900313	<a href="#">Seminar in Operations Research (Bachelor)</a>	Prüfung (PR)		Rebennack

### Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

### Prerequisites

None.

### Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

### Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

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



**Seminar on Methodical Foundations of Operations Research**

Seminar (S)

2550131, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)**Content**

The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor students are introduced to the style of scientific work. By focused treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientific reasoning. Also rhetoric abilities may be improved.

**Remarks:**

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

**Assessment:**

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation. The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

**Workload:**

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

**Literature**

Die Literatur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbereitung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a preparatory meeting.

**Seminar: Modern OR and Innovative Logistics**

Seminar (S)

2550491, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)**Content**

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

**Seminar: Modern OR and Innovative Logistics**

Seminar (S)

2550491, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Content**

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Attendance is compulsory for the preliminary meeting as well for all seminar presentations.

**Exam:**

The assessment consists of a written seminar thesis of 20-25 pages and a presentation of 35-40 minutes (according to §4(2), 3 of the examination regulation).

The final mark for the seminar consists of the seminar thesis, the seminar presentation, the handout, and if applicable further material such as programming code.

The seminar can be attended both by Bachelor and Master students. A differentiation will be achieved by different valuation standards for the seminar thesis and presentation.

**Requirements:**

If possible, at least one module of the institute should be taken before attending the seminar.

**Objectives:**

The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

**Literature**

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

T

**6.195 Course: Seminar in Statistics (Bachelor) [T-WIWI-103489]**

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

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

**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	2521310	<a href="#">Topics in Econometrics</a>	2 SWS	Seminar (S)	Schienle, Chen, G6rgen

**Competence Certificate**

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

**Prerequisites**

None.

**Recommendation**

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

**Annotation**

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

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

V

**Topics in Econometrics**

2521310, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

T

**6.196 Course: Seminar Production Technology [T-MACH-109062]**

**Responsible:** Prof. Dr.-Ing. Jürgen Fleischer  
 Prof. Dr.-Ing. Gisela Lanza  
 Prof. Dr.-Ing. Volker Schulze

**Organisation:** KIT Department of Mechanical Engineering

**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
SS 2020	2149665	<a href="#">Seminar Production Technology</a>	1 SWS	Seminar (S)	Fleischer, Lanza, Schulze, Zanger
Exams					
WS 19/20	76-T-MACH-109062	<a href="#">Seminar Production Technology</a>		Prüfung (PR)	Fleischer, Lanza, Schulze

**Competence Certificate**

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

**Prerequisites**

none

**Annotation**

The specific topics are published on the homepage of the wbk Institute of Production Science.

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

V

**Seminar Production Technology**

2149665, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Seminar (S)

**Content**

In course of the seminar Production Technology current issues of the wbk main fields of research "Manufacturing and Materials Technology", "Machines, Equipment and Process Automation" as well as "Production Systems" are discussed.

The specific topics are published on the homepage of the wbk Institute of Production Science.

**Learning Outcomes:**

The students ...

- are in a position to independently handle current, research-based tasks according to scientific criteria.
- are able to research, analyze, abstract and critically review the information.
- can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- can logically and systematically present the obtained 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.

**Workload:**

regular attendance: 10 hours

self-study: 80 hours

T

**6.197 Course: Seminar: Legal Studies I [T-INFO-101997]**

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-WIWI-101816 - Seminar Module](#)

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

Events					
WS 19/20	24389	<a href="#">IT-Sicherheit und Recht</a>	2 SWS	Seminar (S)	Schallbruch
SS 2020	2400041	<a href="#">Governance, Risk &amp; Compliance</a>	2 SWS	Seminar (S)	Herzig
SS 2020	2400061	<a href="#">Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung</a>	2 SWS	Seminar (S)	Bless, Boehm, Hartenstein, Madche, Sunyaev, Zitterbart
SS 2020	2400153	<a href="#">Online Manipulative Practices: New Technologies and Fundamental Rights Infringements</a>	2 SWS	Seminar (S)	Boehm
SS 2020	24820	<a href="#">Current Issues in Patent Law</a>	2 SWS	Seminar (S)	Melullis
Exams					
WS 19/20	7500035	<a href="#">Seminar: Legal Studies II</a>		Prüfung (PR)	Barczak
WS 19/20	7500182	<a href="#">Seminar: Legal Studies II</a>		Prüfung (PR)	Dreier, Boehm, Raabe
SS 2020	7500140	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Dreier, Boehm, Melullis, Matz
SS 2020	7500159	<a href="#">Seminar: Legal Studies I</a>		Prüfung (PR)	Eichenhofer

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

V

**Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung**2400061, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**Registration via <https://portal.wiwi.kit.edu/ys/2708>

V

**Online Manipulative Practices: New Technologies and Fundamental Rights Infringements**2400153, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

**Content**

New science-based technologies are fostering the process of making individuals more amenable to forms of manipulation online. The more technological capabilities improve, the more surveillance expands, the life of individuals becomes transparent, easier to predict and therefore easier to manipulate. More invasive practices lead to infringements of fundamental rights, which are not always easy to detect, as surveillance and manipulation techniques are getting more sophisticated and less obvious. After the now notorious Cambridge Analytica data scandal, we have now hard evidence individuals are exposed to manipulative practices online, which are most of the time difficult to detect as they operate silently and automatically. Manipulative practices aim at covertly subverting another person's capacity for conscious decision-making by exploiting in particular his/her cognitive, emotional, or other decision-making vulnerabilities. They involve influences that (1) are hidden, (2) exploit vulnerabilities, and (3) are targeted. The seminar has the objective to discuss a series of new technologies and techniques that are and can be used in online manipulative practices and analyse their legal and ethical implications. Special attention is dedicated to the risk such practices pose to fundamental rights such as the right to privacy, the right to the protection of personal data and the right to non-discrimination.

10 sub-topics are provided below. It is a list of new technologies and techniques that can be used in manipulative practices. Students should pick one sub-topic in order to write a short paper and prepare a presentation. Students work is guided through a series of questions and a list of recommended literature. In short, papers and presentations should be generally structured in this way:

- Describe the technology/techniques.
- Describe the legal and ethical implications stemming from the use and application of the selected technology/techniques. What fundamental rights are at stake?
- Focus on one legal aspect, for example the infringement of the right to privacy, (the sub-topic title and description and list of literature already guide the student in this sense), analyse the current legal framework concerning the protection of that right and describe the legal challenges that these new technologies and methods pose.

We also encourage students to investigate possible technical solutions to the problems highlighted in their analysis.

T

**6.198 Course: Services Marketing and B2B Marketing [T-WIWI-102806]**

**Responsible:** Prof. Dr. Martin Klarmann  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101424 - Foundations of Marketing](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	2572158	<a href="#">Services Marketing and B2B Marketing</a>	2 SWS	Lecture (V)	Klarmann
Exams					
WS 19/20	7900081	<a href="#">Services Marketing and B2B Marketing</a>		Prüfung (PR)	Klarmann
WS 19/20	7900126	<a href="#">Services Marketing and B2B Marketing</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

**Services Marketing and B2B Marketing**

2572158, WS 19/20, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)



**Content**

The aim of this course is to prepare students for two certain marketing perspectives. The service marketing is concentrated on the particularities coming up when a company sells services instead of products. Subjects in this section are for example:

- Measuring service quality
- Pricing services
- Management of service staff

The second part of the course contains a business-to-business marketing perspective. Topics are below others:

- Management of buying centers
- Competitive Bidding
- B2B-Branding

**Students**

- know about the characteristics of service- and B2B environments
- are able to apply different methods (SERVQUAL, Gap-model, Mystery Shopping) to measure the quality of services
- are able to design pricing systems for services
- know about queuing management
- are able to plan capacities in service environments
- are able to identify different types of B2B businesses and know about their characteristics
- know about the specifics and challenges of B2B branding
- know central theories about organizational buying
- are able to apply the concept of competitive bidding for tenders
- are able to prepare, conduct, and review price negotiations

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The total workload for this course is approximately 90 hours.

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

**Literature**

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

T

**6.199 Course: Social Science A (WiWi) [T-GEISTSOZ-109048]****Responsible:** Prof. Dr. Gerd Nollmann**Organisation:** KIT Department of Humanities and Social Sciences**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

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

Events					
WS 19/20	5011011	<a href="#">Economic inequality</a>	2 SWS	Seminar (S)	Binder
WS 19/20	5011014	<a href="#">Sociology of Technology</a>	SWS	Seminar (S)	Lösch
SS 2020	5011003	<a href="#">Social Change and Social Policy</a>	2 SWS	Seminar (S)	Binder
SS 2020	5011008	<a href="#">Sociology of Organizations</a>	2 SWS	Seminar (S)	Kauppert
SS 2020	5011013	<a href="#">Economic Inequality</a>	2 SWS	Seminar (S)	Binder
SS 2020	5011019	<a href="#">Sociology of Organizations</a>	2 SWS	Seminar (S)	Kauppert
Exams					
WS 19/20	7400041	<a href="#">Social Science A (WiWi)</a>		Prüfung (PR)	Nollmann

T

**6.200 Course: Social Science B (WiWi) [T-GEISTSOZ-109049]****Responsible:** Prof. Dr. Gerd Nollmann**Organisation:** KIT Department of Humanities and Social Sciences**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

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

Events					
WS 19/20	5011011	<a href="#">Economic inequality</a>	2 SWS	Seminar (S)	Binder
WS 19/20	5011014	<a href="#">Sociology of Technology</a>	SWS	Seminar (S)	Lösch
Exams					
WS 19/20	7400046	<a href="#">Social Science B (WiWi)</a>		Prüfung (PR)	Nollmann

T

**6.201 Course: Special Topics in Information Systems [T-WIWI-109940]**

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101434 - eBusiness and Service Management](#)

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

Exams				
WS 19/20	7900263	<a href="#">Special Topics in Information Systems</a>	Prüfung (PR)	Weinhardt

**Competence Certificate**

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

**Prerequisites**

see below

**Recommendation**

None

**Annotation**

All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Systems course. The current topics of the practical seminars are available at the following homepage: [www.iism.kit.edu/im/lehre](http://www.iism.kit.edu/im/lehre)

The Special Topics Information Systems is equivalent to the practical seminar, as it was only offered for the major in "Information Management and Engineering" so far. With this course students majoring in "Industrial Engineering and Management" and "Economics Engineering" also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Systems can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.

T

## 6.202 Course: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

**Responsible:** apl. Prof. Dr. Wolf-Dieter Heller  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101420 - Econometrics and Economics](#)  
[M-WIWI-101608 - Statistics and Econometrics](#)

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

Events					
WS 19/20	2521350	<a href="#">Statistical Modeling of Generalized Regression Models</a>	2 SWS	Lecture (V)	Heller
Exams					
WS 19/20	7900146	<a href="#">Statistical Modeling of generalized regression models</a>		Prüfung (PR)	Heller

### Competence Certificate

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

### Prerequisites

None

### Recommendation

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

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

V

## Statistical Modeling of Generalized Regression Models

2521350, WS 19/20, 2 SWS, [Open in study portal](#)

Lecture (V)

### Content

#### Learning objectives:

The student has profound knowledge of generalized regression models.

#### Requirements:

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

#### Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

T

**6.203 Course: Statistics I [T-WIWI-102737]**

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

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

**Part of:** [M-WIWI-101432 - Introduction to Statistics](#)  
[M-WIWI-101726 - Preliminary Exam](#)

Type	Credits	Recurrence	Version
Written examination	5	Each summer term	1

Events					
SS 2020	2600008	<a href="#">Statistics I</a>	4 SWS	Lecture (V)	Grothe
Exams					
WS 19/20	7900009	<a href="#">Statistics I</a>		Prüfung (PR)	Schienle

**Competence Certificate**

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

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

**Prerequisites**

None

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

V

**Statistics I**

2600008, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

The Student understands and applies

- the basic concepts of statistical data exploration,
- the basic definitions and theorems of probability theory.

**Content:**

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities

C. Random variables: location and shape parameters, dependency measures, concrete distribution models

**Workload:**

Total workload for 5 CP: approx. 150 hours

Attendance: 60 hours

Preparation and follow-up: 90 hours

**Literature**

Skriptum: Kurzfassung Statistik I

**Weiterführende Literatur:**

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

**6.204 Course: Statistics II [T-WIWI-102738]**

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

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

**Part of:** [M-WIWI-101432 - Introduction to Statistics](#)

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

Events					
WS 19/20	2610020	<a href="#">Statistics II</a>	4 SWS	Lecture (V)	Schienle
WS 19/20	2610021		2 SWS	Tutorial (Tu)	Schienle, Rüter, Zerwas
WS 19/20	2610022	<a href="#">PC-Praktikum zu Statistik II</a>	2 SWS		Schienle, Görgen
Exams					
WS 19/20	7900282	<a href="#">Statistics II</a>		Prüfung (PR)	Schienle
SS 2020	7900737	<a href="#">Statistics II</a>		Prüfung (PR)	Schienle

**Competence Certificate**

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

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

**Prerequisites**

None

**Recommendation**

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

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

**Statistics II**

2610020, WS 19/20, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content****Learning objectives:**

The student

- understands and applies the basic definitions and theorems of probability theory,
- transfers these theoretical foundations to problems in parametrical mathematical statistics.

**Content:**

D. Sampling and Estimation Theory: Sampling distributions, estimators, point and interval estimation

E. Test Theory: General Principles of Hypothesis Testing, Concrete 1- and 2-Sampling Tests

F. Regression analysis: Simple and multiple linear regression, statistical inference

**Requirements:**

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2600020].

**Workload:**

Total workload: 150 hours (5.0 Credits).

Attendance: 30 hours

Preparation and follow-up: 90 hours



**Literature**

Skriptum: Kurzfassung Statistik II

**Weiterführende Literatur:**

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

T

## 6.205 Course: Strategic Finance and Technoloy Change [T-WIWI-110511]

**Responsible:** Prof. Dr. Martin Ruckes  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101423 - Topics in Finance II](#)  
[M-WIWI-101465 - Topics in Finance I](#)

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

Events					
WS 19/20	2530214	<a href="#">Strategic Finance and Technology Change</a>	1 SWS	Lecture (V)	N.N.
Exams					
WS 19/20	7900219	<a href="#">Strategic Finance and Technoloy Change</a>		Prüfung (PR)	Ruckes

**Competence Certificate**

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

**Prerequisites**

None

**Recommendation**

Attending the lecture "Financial Management" is strongly recommended.

T

**6.206 Course: Supplement Applied Informatics [T-WIWI-110711]****Responsible:** Professorenschaft des Fachbereichs Informatik**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101426 - Electives in Informatics](#)

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

**Competence Certificate**

The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation. Depending on the particular course associated with this placeholder a bonus on the examination grade is possible.

**Prerequisites**

None

**Annotation**

This course can be used in particular for the acceptance of external courses whose content is in the broader area of applied informatics, but is not equivalent to another course of this topic.

T

**6.207 Course: Systems of Remote Sensing, Prerequisite [T-BGU-101637]**

**Responsible:** Prof. Dr.-Ing. Stefan Hinz  
Dr.-Ing. Uwe Weidner

**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences

**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

Type	Credits	Recurrence	Version
Completed coursework	1	Each summer term	1

Events					
SS 2020	6020242	<a href="#">Fernerkundungssysteme, Übung</a>	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2020	8284101637	<a href="#">Systems of Remote Sensing, Prerequisite</a>		Prüfung (PR)	Weidner

**Prerequisites**

None

**Recommendation**

None

**Annotation**

None

## T

## 6.208 Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101413 - Applications of Operations Research](#)  
[M-WIWI-101421 - Supply Chain Management](#)  
[M-WIWI-103278 - Optimization under Uncertainty](#)

Type	Credits	Recurrence	Version
Written examination	4,5	Each summer term	3

Events					
SS 2020	2550486	<a href="#">Taktisches und operatives SCM</a>	2 SWS	Lecture (V)	Nickel
SS 2020	2550487	<a href="#">Übungen zu Taktisches und operatives SCM</a>	1 SWS	Practice (Ü)	Dunke
Exams					
WS 19/20	00012	<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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

**Content**

The planning of material transport is an essential element of Supply Chain Management. By linking transport connections across different facilities, the material source (production plant) is connected with the material sink (customer). The general supply task can be formulated as follows (cf. Gudehus): For given material flows or shipments, choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. The main goal of the inventory management is the optimal determination of order quantities in terms of minimization of fixed and variable costs subject to resource constraints, supply availability and service level requirements. Similarly, the problem of lot sizing in production considers the determination of the optimal amount of products to be produced in a time slot. The course includes an introduction to basic terms and definitions of Supply Chain Management and a presentation of fundamental quantitative planning models for distribution, vehicle routing, inventory management and lot sizing. Furthermore, case studies from practice will be discussed in detail.

**Literature****Weiterführende Literatur**

- Domschke: Logistik: Transporte, 5. Auflage, Oldenbourg, 2005
- Domschke: Logistik: Rundreisen und Touren, 4. Auflage, Oldenbourg, 1997
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
- Simchi-Levi, Kaminsky, Simchi-Levi: Designing and Managing the Supply Chain, 3rd edition, McGraw-Hill, 2008
- Silver, Pyke, Peterson: Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998

T

## 6.209 Course: Tax Law I [T-INFO-101315]

**Responsible:** Prof. Dr. Thomas Dreier  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	1

Events					
WS 19/20	24168	<a href="#">Tax Law I</a>	2 SWS	Lecture (V)	Dietrich
Exams					
WS 19/20	7500066	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500052	<a href="#">Tax Law I</a>		Prüfung (PR)	Dreier, Matz

## T 6.210 Course: Tax Law II [T-INFO-101314]

**Responsible:** Detlef Dietrich  
Prof. Dr. Thomas Dreier

**Organisation:** KIT Department of Informatics

**Part of:** [M-INFO-101216 - Private Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24646	<a href="#">Tax Law II</a>	2 SWS	Lecture (V)	Dietrich
Exams					
WS 19/20	7500067	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500053	<a href="#">Tax Law II</a>		Prüfung (PR)	Dreier, Matz



T

**6.211 Course: Telecommunications Law [T-INFO-101309]**

**Responsible:** Prof. Dr. Nikolaus Marsch  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101217 - Public Business Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2020	24632	<a href="#">Telekommunikationsrecht</a>	2 SWS	Lecture (V)	Hermstrüwer
Exams					
WS 19/20	7500049	<a href="#">Telecommunications Law</a>		Prüfung (PR)	Barczak
SS 2020	7500085	<a href="#">Telecommunications Law</a>		Prüfung (PR)	Eichenhofer

T

## 6.212 Course: Trademark and Unfair Competition Law [T-INFO-101313]

**Responsible:** Dr. Yvonne Matz  
**Organisation:** KIT Department of Informatics  
**Part of:** [M-INFO-101215 - Intellectual Property Law](#)

Type	Credits	Recurrence	Version
Written examination	3	Each term	1

Events					
WS 19/20	24136	<a href="#">Trademark and Unfair Competition Law</a>	2 SWS	Lecture (V)	Matz
Exams					
WS 19/20	7500061	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz
SS 2020	7500051	<a href="#">Trademark and Unfair Competition Law</a>		Prüfung (PR)	Dreier, Matz

T

**6.213 Course: Virtual Reality Practical Course [T-MACH-102149]****Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

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

Events					
WS 19/20	2123375	<a href="#">Virtual Reality Practical Course</a>	3 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
Exams					
WS 19/20	76-T-MACH-102149	<a href="#">Virtual Reality Practical Course</a>		Prüfung (PR)	Ovtcharova

**Competence Certificate**

Assessment of another type (graded)

**Prerequisites**

None

**Annotation**

Number of participants is limited

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

V

**Virtual Reality Practical Course**2123375, WS 19/20, 3 SWS, Language: German/English, [Open in study portal](#)**Project (PRO)****Content**

- Introduction in Virtual Reality (hardware, software, applications)
- Exercises in the task specific software systems
- Autonomous project work in the area of Virtual Reality in small groups

**Literature**

Keine / None

T

**6.214 Course: Welfare Economics [T-WIWI-102610]**

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** [M-WIWI-101501 - Economic Theory](#)

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

**Competence Certificate**

The assessment consists of a written exam at the end of the semester (according to Section 4 (2), 1 or 2 of the examination regulation).

**Prerequisites**

The courses *Economics I: Microeconomics* [2610012] and *Economics II: Macroeconomics* [2600014] have to be completed beforehand.

**Recommendation**

None