KIT

Karlsruher Institut für Technologie

Module Handbook
Economics Engineering B.Sc.

SPO 2015

Winter term 2019/20

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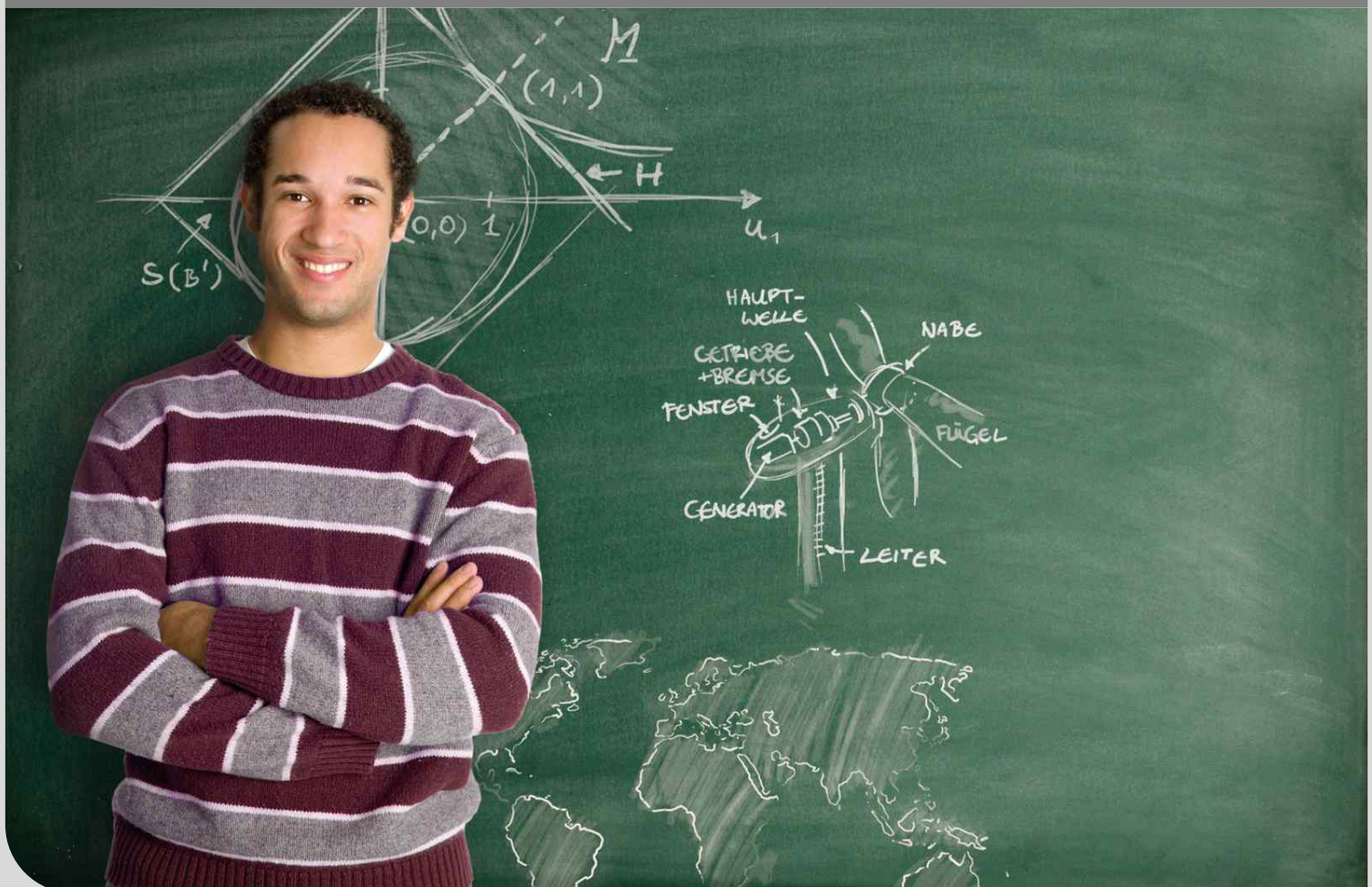
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1 Welcome to the new module handbook of your study programme

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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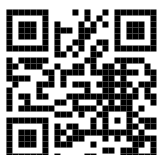
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2 About this handbook

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.

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 examamination. If the module examination is subdivided into partial examinations, the content of each course will be examined in corresponding partial examinations. Registration for examinations can be done online at the campus management portal. The following functions can be accessed on https://campus.studium.kit.edu/:

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

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

2.1.4 Types of exams

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

2.1.5 Repeating exams

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

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

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

2.1.6 Examiners

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

2.1.7 Additional accomplishments

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

2.1.8 Further information

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

2.2 Contact

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

Orientational 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

Modelled Conditions

The following conditions have to be fulfilled:

1. You need to earn at least 120 credits in the following fields:
   - Internship
   - Informatics
   - Mathematics
   - Operations Research
   - Physics or Chemistry
   - Law
   - Statistics
   - Compulsory Elective Modules

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: Vertiefungsprogramm Betriebswirtschaftslehre (1 item)		
M-WIWI-101467	Design, Construction and Sustainability Assessment of Buildings	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101460	CRM and Service Management *First usage possible until 3/31/2020.*	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-105035	Empirical Finance neu	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
M-WIWI-101422	Specialization in Customer Relationship Management *First usage possible until 3/31/2020.*	9 CR

4.5 Economics

		Credits 33

Mandatory		
M-WIWI-105204	Economics neu	10 CR
M-WIWI-105203	Introduction in Econometrics neu	5 CR
Election block: Vertiefungsprogramm Volkswirtschaftslehre (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: Physik oder Chemie (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
Election block: Volkswirtschaftslehre (at most 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
Election block: Betriebswirtschaftslehre (at most 18 credits)		
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101460	CRM and Service Management *First usage possible until 3/31/2020.*	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	9 CR
M-WIWI-105035	Empirical Finance neu	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
M-WIWI-101422	Specialization in Customer Relationship Management *First usage possible until 3/31/2020.*	9 CR
Election block: Informatik (at most 18 credits)		
M-WIWI-101426	Electives in Informatics	9 CR
M-WIWI-105112	Applied Informatics neu	9 CR
Election block: Operations Research (at most 18 credits)		
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
Election block: Ingenieurwissenschaften (at most 18 credits)		
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-101299	Mechanical Design	8 CR
M-MACH-101277	Material Flow in Logistic Systems neu	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 neu	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
Election block: Statistik (at most 9 credits)		
M-WIWI-101608	Statistics and Econometrics	9 CR
Election block: Recht oder Soziologie (at most 9 credits)		
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: Wahlpflichtangebot (between 1 and 2 items)			
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CR	Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CR	Nickel
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-102726	Global Optimization I	4,5 CR	Stein
T-WIWI-106199	Modeling and OR-Software: Introduction	4,5 CR	Nickel
T-WIWI-106545	Optimization under Uncertainty	4,5 CR	Rebennack

Competence Certificate

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 seperately.

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

Competence Goal

The student

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

Prerequisites

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

Content

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

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

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

Recommendation

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

Annotation

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

Workload

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

M 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 (Informatik)

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

Election block: Programmierung kommerzieller Systeme (1 item)			
T-WIWI-102747	Advanced Programming - Java Network Programming	4,5 CR	Ratz
T-WIWI-102748	Advanced Programming - Application of Business Software	4,5 CR	Klink, Oberweis
Election block: Ergänzungsangebot (1 item)			
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

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 alternativly *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 (Vertiefungsprogramm Volkswirtschaftslehre)
	Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	3

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102876	Auction & Mechanism Design	4,5 CR	Szech
T-WIWI-102892	Economics and Behavior	4,5 CR	Szech
T-WIWI-102850	Introduction to Game Theory	4,5 CR	Puppe, Reiß
T-WIWI-102792	Decision Theory	4,5 CR	Ehrhart
T-WIWI-102844	Industrial Organization	4,5 CR	Reiß
T-WIWI-102739	Public Revenues	4,5 CR	Wigger
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch

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

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

Competence Goal
Students

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

Prerequisites
None.

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

Recommendation
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 (Ingenieurwissenschaften)

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

Election block: Wahlpflicht (between 1 and 2 items)			
T-MACH-102194	Combustion Engines I	5 CR	Koch, Kubach
T-MACH-105564	Energy Conversion and Increased Efficiency in Internal Combustion Engines	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 (Ingenieurwissenschaften)

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 mapsEmissions and Exhaust gas aftertreatment

Transient engine operationECU 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 (Recht oder Soziologie)

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

Mandatory			
T-INFO-102013	Exercises in Civil Law	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	3

Election block: Verfassungs- und Verwaltungsrecht (between 1 and 2 items as well as 6 credits)			
T-INFO-110300	Public Law I & II	6 CR	Marsch
T-INFO-101963	Public Law I - Basic Principles	3 CR	Marsch
T-INFO-102042	Public Law II - Public Business Law	3 CR	Marsch

Workload

See German version.

M 5.8 Module: CRM and Service Management [M-WIWI-101460]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre) (Usage until 3/31/2020)
Compulsory Elective Modules (Betriebswirtschaftslehre) (Usage until 3/31/2020)

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

Election block: Wahlpflichtangebot (2 items)			
T-WIWI-102595	Customer Relationship Management	4,5 CR	Geyer-Schulz
T-WIWI-102597	Operative CRM	4,5 CR	Geyer-Schulz

Competence Certificate
This module will be offered for the last time in winter semester 2019/20.

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

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

Competence Goal
The student

- understands service management as the managerial foundation of customer relationship management and the resulting implications for strategic management, the organisational structure, and the functional areas of the comapany,
- develops and designs service concepts and service systems on a conceptual level,
- works in teams on case studies and respects project dates, integrates international literature of the discipline,
- knows the current developments in CRM in science as well as in industry,
- knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases,
- designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, …).

Prerequisites
None

Content
In the module CRM and Service Management we teach the principles of modern customer-oriented management and its support by system architectures and CRM software packages. Choosing customer relationship management as a company's strategy requires service management and a strict implementation of service management in all parts of the company.

For operative CRM we present the design of customer-oriented, IT-supported business processes based on business process modelling and we explain these processes in concrete application scenarios (e.g. marketing campaign management, call center management, sales force management, field services, …).

Analytic CRM is dedicated to improve the use of knowledge about customers in the broadest sense for decision-making (e.g. product-mix decisions, bonus programs based on customer loyality, …) and for the improvement of services. A requirement for this is the tight integration of operative systems with a data warehouse, the development of customer-oriented and flexible reporting systems, and – last but not least – the application of statistical methods (clustering, regression, stochastic models, …).

Annotation
The lecture *Customer Relationship Management* [2540508] is given in English.

Workload
The total amount of work for this module is approximately 270 hours (9 credits). The subdivision is based on the credits of the courses of the module.
The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam periods and the time that is required to achieve the objectives of the module as an average student with an average performance.

M 5.9 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 (Vertiefungsprogramm Betriebswirtschaftslehre)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

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

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

Recommendation

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

Furthermore a combination with courses in the area of

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

is recommended.

Workload

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

M 5.10 Module: eBusiness and Service Management [M-WIWI-101434]

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

Credits	Language	Level	Version
9	German	3	8

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-109941	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	Weinhardt
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt
T-WIWI-109808	Wildcard eBusiness and Service Management	4,5 CR	

Competence Certificate

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

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

Competence Goal

The students

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

Prerequisites

None

Content

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

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

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

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

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

Annotation

All practical Seminars offered at the IM can be chosen for *Special Topics in Information Systems*. Please update yourself on www.iism.kit.edu/im/lehre

Workload

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

M   5.11 Module: Econometrics and Economics [M-WIWI-101420]

Responsible:	apl. Prof. Dr. Wolf-Dieter Heller
Organisation:	KIT Department of Economics and Management
Part of:	Economics (Vertiefungsprogramm Volkswirtschaftslehre)
	Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Recurrence	Level	Version
9	Once	3	3

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-102792	Decision Theory	4,5 CR	Ehrhart
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller
T-WIWI-102844	Industrial Organization	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   5.12 Module: Economic Policy I [M-WIWI-101668]

Responsible:	Prof. Dr. Ingrid Ott
Organisation:	KIT Department of Economics and Management
Part of:	Economics (Vertiefungsprogramm Volkswirtschaftslehre)
	Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	9

Mandatory			
T-WIWI-103213	Basic Principles of Economic Policy	4,5 CR	Ott
Election block: Wahlpflichtangebot (1 item)			
T-WIWI-109121	Macroeconomic Theory	4,5 CR	Brumm
T-WIWI-102739	Public Revenues	4,5 CR	Wigger
T-WIWI-102908	Personnel Policies and Labor Market Institutions	4,5 CR	Nieken
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch

Competence Certificate

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

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

Competence Goal

Students shall be given the ability to

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

Prerequisites

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

Content

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

Recommendation

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

Workload

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

M 5.13 Module: Economic Theory [M-WIWI-101501]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: Economics (Vertiefungsprogramm Volkswirtschaftslehre)
Compulsory Elective Modules (Volkswirtschaftslehre)

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

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

Competence Certificate

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

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

Competence Goal

See German version.

Prerequisites

None

Content

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

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

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

Recommendation

None

Annotation

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

M 5.14 Module: Economics [M-WIWI-105204]

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

Credits	Language	Level	Version
10	German	3	1

Mandatory			
T-WIWI-102708	Economics I: Microeconomics	5 CR	Puppe, Reiß
T-WIWI-102709	Economics II: Macroeconomics	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 5.15 Module: eFinance [M-WIWI-101402]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	German/English	3	7

Mandatory		
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
Election block: Ergänzungsangebot (at least 4,5 credits)		
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg

Competence Certificate

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

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

Competence Goal

The students

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

Prerequisites

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

Content

The module "eFinance: 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 addtion the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a suplementary understanding for capital markets.

Information management topics are 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 5.16 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 (Informatik)

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

Election block: Wahlpflichtangebot (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-104679	Foundations of Mobile Business	4,5 CR	Oberweis
T-WIWI-110108	Visual Computing	4,5 CR	Landesberger von Antburg
Election block: Praktika (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
T-WIWI-109271	Advanced Lab User Studies in 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 5.17 Module: Empirical Finance [M-WIWI-105035]

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

Credits	Language	Level	Version
9	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 5.18 Module: Energy Economics [M-WIWI-101464]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

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

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

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

Competence Goal
The student

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

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

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

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

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

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

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

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

M 5.19 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 (Vertiefungsprogramm Betriebswirtschaftslehre)
	Compulsory Elective Modules (Betriebswirtschaftslehre)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

Workload

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

M 5.20 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	Experimental Physics	14 CR	Schimmel

Competence Certificate

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

Prerequisites

M   5.21 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 (Ingenieurwissenschaften)

Credits	Recurrence	Level	Version
9	Once	3	4

Election block: Wahlpflichtangebot (between 9 and 12 credits)			
T-WIWI-106291	PH APL-ING-TL01	3 CR	
T-WIWI-106292	PH APL-ING-TL02	3 CR	
T-WIWI-106293	PH APL-ING-TL03	3 CR	
T-WIWI-106294	PH APL-ING-TL04 ub	0 CR	
T-WIWI-106295	PH APL-ING-TL05 ub	0 CR	
T-WIWI-106296	PH APL-ING-TL06 ub	0 CR	
T-WIWI-108384	PH APL-ING-TL07	3 CR	

Competence Certificate

The assessment of the module is determined by the respective module corrdinator. 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) 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.

M 5.22 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 5.23 Module: Foundations of Marketing [M-WIWI-101424]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

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

Mandatory		
T-WIWI-102805	Managing the Marketing Mix	4,5 CR	Klarmann
Election block: Ergänzungsangebot (at least 4,5 credits)		
T-WIWI-102806	Services Marketing and B2B Marketing	3 CR	Klarmann
T-WIWI-102807	International Marketing	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).

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

M 5.24 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	Business Administration: Strategic Management and Information Engineering and Management	3 CR	Nieken, Ruckes
T-WIWI-102819	Business Administration: Finance and Accounting	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 5.25 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	Language	Level	Version
8	German	3	1

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

Competence Certificate
The 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 5.26 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 (Ingenieurwissenschaften)

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

Mandatory			
T-BGU-101691	Construction Technology	6 CR	Haghsheno
T-BGU-101675	Project Management	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

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.

M 5.27 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 (Vertiefungsprogramm Betriebswirtschaftslehre)
	Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	German	3	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-105711	Practical Seminar Digital Services	4,5 CR	Satzger, Weinhardt

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

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

Competence Goal
Students

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

Prerequisites
None

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

Recommendation
None

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

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

M	**5.28 Module: General and Inorganic Chemistry [M-CHEMBIO-102335]**

Organisation: KIT Department of Chemistry and Biosciences
Part of: Physics or Chemistry

Credits	Language	Level	Version
7	German	3	1

Mandatory			
T-CHEMBIO-101866	General and Inorganic Chemistry	7 CR	Ruben

Prerequisites

M 5.29 Module: Human Resources and Organizations [M-WIWI-101513]

Responsible:	Prof. Dr. Petra Nieken
Organisation:	KIT Department of Economics and Management
Part of:	Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)
	Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	4

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

Competence Certificate

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

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

Competence Goal

The student

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

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

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

Mandatory			
T-WIWI-102606	Fundamentals of Production Management	5,5 CR	Schultmann
Election block: Ergänzungsangebot (3,5 credits)			
T-WIWI-102870	Logistics and Supply Chain Management	3,5 CR	Wiens
T-WIWI-102820	Production Economics and Sustainability	3,5 CR	Rimbon

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   5.31 Module: Information Systems & 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 (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	German	3	3

Election block: Wahlpflichtangebot ()		
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-109936	Platform Economy	4,5 CR	Weinhardt
T-WIWI-109935	Practical Seminar Interaction	4,5 CR	Mädche, 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 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.

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: Platforms [M-WIWI-104912]

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

Credits	Language	Level	Version
9	German	3	3

Election block: Wahlpflichtangebot ()			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-109936	Platform Economy	4,5 CR	Weinhardt
T-WIWI-109937	Practical Seminar Platforms	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 5.33 Module: Information Systems & Digital Business: Servitization [M-WIWI-104913]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	German	3	2

Election block: Wahlpflichtangebot ()			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-109939	Practical Seminar Servitization	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 5.34 Module: Integrated Production Planning [M-MACH-101272]

Responsible: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory		
T-MACH-109054	Integrated Production Planning in the Age of Industry 4.0	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 5.35 Module: Intellectual Property Law [M-INFO-101215]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: Compulsory Elective Modules (Recht oder Soziologie)

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

Election block: Recht des Geistigen Eigentums (at least 1 item as well as at least 9 credits)			
T-INFO-102036	Computer Contract Law	3 CR	Dreier
T-INFO-101308	Copyright	3 CR	Dreier
T-INFO-101310	Patent Law	3 CR	Dreier
T-INFO-101313	Trademark and Unfair Competition Law	3 CR	Matz
T-INFO-101307	Internet Law	3 CR	Dreier
T-INFO-108462	Selected Legal Isues of Internet Law	3 CR	Dreier

Prerequisites
None

M 5.36 Module: Internship [M-WIWI-101610]

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

Credits	Recurrence	Language	Level	Version
10	Once	German	3	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 (weakly)
* Working interruption, indicating the vacation and sick days
* Department
* Headwords to the activitis

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. Therefor 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   5.37 Module: Introduction in Econometrics [M-WIWI-105203]

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

Credits	Language	Level	Version
5	German	3	1

Mandatory		
T-WIWI-102736	Economics III: Introduction in Econometrics	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 5.38 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	2

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

M 5.39 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 (Ingenieurwissenschaften)

Credits	Recurrence	Language	Level	Version
9	Each term	German	3	3

Election block: Wahlpflichtangebot (between 9 and 12 credits)			
T-BGU-101500	Introduction to Engineering Geology	5 CR	Blum
T-BGU-103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite	3 CR	Rösch, Wursthorn
T-BGU-101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences	3 CR	Rösch, Wursthorn
T-BGU-101637	Systems of Remote Sensing, Prerequisite	1 CR	Hinz
T-BGU-101638	Procedures of Remote Sensing, Prerequisite	1 CR	Weidner
T-BGU-101636	Remote Sensing, Exam	4 CR	Hinz
T-BGU-103542	Procedures of Remote Sensing	3 CR	Weidner
T-PHYS-103525	Geological Hazards and Risk	8 CR	Gottschämmer
T-BGU-101693	Hydrology	4 CR	Zehe
T-PHYS-101092	Climatology	5 CR	Ginete Werner Pinto, Maurer
T-BGU-101814	Project in Applied Remote Sensing	1 CR	Hinz
T-PHYS-105594	Exam on Climatology	1 CR	Ginete Werner Pinto
T-BGU-101667	Hydraulic Engineering and Water Management	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 5.40 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	Introduction to Operations Research I and II	9 CR	Nickel, Rebennack, Stein

Competence Certificate

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

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

Competence Goal

The student

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

Module grade calculation

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

Prerequisites

None

Content

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

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

Workload

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

M 5.41 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	Introduction to Programming with Java	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 prerequisited 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 5.42 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	Statistics I	5 CR	Grothe, Schienle
T-WIWI-102738	Statistics II	5 CR	Grothe, Schienle

Competence Certificate

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

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

Competence Goal

See German version.

Module grade calculation

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

Prerequisites

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

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

Workload

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

| M | **5.43 Module: Laboratory Work in Inorganic Chemistry [M-CHEMBIO-104026]** |

Organisation: KIT Department of Chemistry and Biosciences
Part of: Physics or Chemistry

Credits	Language	Level	Version
7	German	3	1

Mandatory		
T-CHEMBIO-108287	Laboratory Work in General and Inorganic Chemistry	7 CR

Prerequisites

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 (Ingenieurwissenschaften)

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

Mandatory			
T-MACH-102158	Machine Tools and Industrial Handling	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 (Vertiefungsprogramm Betriebswirtschaftslehre)
	Compulsory Elective Modules (Betriebswirtschaftslehre)

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

Mandatory			
T-WIWI-102800	Management Accounting 1	4,5 CR	Wouters
T-WIWI-102801	Management Accounting 2	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 (Ingenieurwissenschaften)

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

Mandatory		
T-MACH-102105	Manufacturing Technology	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 (Ingenieurwissenschaften)

Credits	**Language**	**Level**	**Version**
9	German	3	3

Mandatory			
T-MACH-102151	Material Flow in Logistic Systems	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	Mathematics I - Midterm Exam	3,5 CR	Folkers, Hug, Last, Winter
T-MATH-102261	Mathematics I - 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

• 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	Mathematics III - Final Exam	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 (Ingenieurwissenschaften)

Credits	Language	Level	Version
8	German	3	3

Mandatory			
T-MACH-110363	Mechanical Design Basics I and II	6 CR	Albers, Matthiesen
T-MACH-110364	Mechanical Design Basics I, Tutorial	1 CR	Albers, Matthiesen
T-MACH-110365	Mechanical Design Basics II, Tutorial	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&C²-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&C² 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&C²-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&C²-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: Wahlpflichtangebot (at least 1 item as well as between 4,5 and 9 credits)			
T-WIWI-102726	Global Optimization I	4,5 CR	Stein
T-WIWI-103638	Global Optimization I and II	9 CR	Stein
T-WIWI-102724	Nonlinear Optimization I	4,5 CR	Stein
T-WIWI-103637	Nonlinear Optimization I and II	9 CR	Stein
Election block: Ergänzungsangebot ()			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-102727	Global Optimization II	4,5 CR	Stein
T-WIWI-102725	Nonlinear Optimization II	4,5 CR	Stein
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CR	Nickel

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

At least one of the courses *Nonlinear Optimization I* [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 (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	German	4	2

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

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

Mandatory			
T-BGU-101791	Mobility and Infrastructure	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

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	4

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 on 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 examinor 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 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 examinor 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 examinor. 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: Wahlpflichtangebot (between 1 and 2 items)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-106545	Optimization under Uncertainty	4,5 CR	Rebennack
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-102724	Nonlinear Optimization I	4,5 CR	Stein
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CR	Nickel

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

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.ior.kit.edu/28.php.

Workload

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

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 (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	German	3	2

Mandatory			
T-ETIT-101923	Electric Energy Systems	5 CR	Leibfried
T-ETIT-100830	Power Network	6 CR	Leibfried

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

Organisation: University
Part of: Preliminary Exam

Credits 0	**Language** German	**Level** 3	**Version** 1

Mandatory			
T-WIWI-102737	Statistics I	5 CR	Grothe, Schienle
T-WIWI-102708	Economics I: Microeconomics	5 CR	Puppe, Reiß

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

Prerequisites

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 (Recht oder Soziologie)

Credits	Language	Level	Version
9	German	3	3

Election block: Recht der Wirtschaftsunternehmen (at least 1 item as well as at least 9 credits)			
T-INFO-101329	Employment Law I	3 CR	Dreier
T-INFO-101330	Employment Law II	3 CR	Dreier
T-INFO-101315	Tax Law I	3 CR	Dreier
T-INFO-101314	Tax Law II	3 CR	Dietrich, Dreier
T-INFO-101316	Law of Contracts	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 (Ingenieurwissenschaften)

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

Election block: Product Lifecycle Management (Kernbereich) (1 item)			
T-MACH-105147	Product Lifecycle Management	4 CR	Ovtcharova
Election block: Product Lifecycle Management (2 items)			
T-MACH-102153	PLM-CAD Workshop	4 CR	Ovtcharova
T-MACH-102181	PLM for Product Development in Mechatronics	4 CR	Eigner
T-MACH-102209	Information Engineering	3 CR	Ovtcharova
T-MACH-106744	Agile Product Innovation Management - Value-driven Planning of new Products	4 CR	Kläger
T-MACH-106457	I4.0 Systems platform	4 CR	Maier, Ovtcharova
T-MACH-102083	Integrated Information Systems for Engineers	4 CR	Ovtcharova
T-MACH-102155	Product, Process and Resource Integration in the Automotive Industry	4 CR	Mbang
T-MACH-102149	Virtual Reality Practical Course	4 CR	Ovtcharova
T-MACH-102187	CAD-NX Training Course	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:	Prof. Dr. Matthias Bäcker
Organisation:	KIT Department of Informatics
Part of:	Compulsory Elective Modules (Recht oder Soziologie)

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

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

Competence Certificate
see course description.

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

Responsible:	Prof. Dr. Berthold Wigger
Organisation:	KIT Department of Economics and Management
Part of:	Economics (Vertiefungsprogramm Volkswirtschaftslehre)
	Compulsory Elective Modules (Volkswirtschaftslehre)

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102877	Introduction to Public Finance	4,5 CR	Wigger
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102739	Public Revenues	4,5 CR	Wigger
T-WIWI-109590	Public Sector Finance	4,5 CR	Wigger

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

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

Competence Goal
See German version.

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

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

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

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

M 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 (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

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

Recommendation

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

Furthermore a combination with courses in the area of

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

is recommended.

Workload

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

M   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	Language	Level	Version
3	German	3	4

Election block: Wahlpflichtangebot (3 credits)			
T-WIWI-103486	Seminar in Business Administration (Bachelor)	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103485	Seminar in Informatics (Bachelor)	3 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-108763	Seminar in Engineering Science Master (approval)	3 CR	Fachvertreter ingenieurwissenschaftlicher Fakultäten
T-MATH-102265	Seminar in Mathematics (Bachelor)	3 CR	Folkers, Last
T-WIWI-103488	Seminar in Operations Research (Bachelor)	3 CR	Nickel, Rebennack, Stein
T-INFO-101997	Seminar: Legal Studies I	3 CR	Dreier
T-WIWI-103489	Seminar in Statistics (Bachelor)	3 CR	Grothe, Schienle
T-WIWI-103487	Seminar in Economics (Bachelor)	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-MACH-109062	Seminar Production Technology	3 CR	Fleischer, Lanza, Schulze
T-MACH-108737	Seminar Data-Mining in Production	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 detailled 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 (Recht oder Soziologie)

Credits	Language	Level	Version
9	German	3	2

Mandatory			
T-GEISTSOZ-109047	Analalysis of Social Structurs (WiWi)	3 CR	Nollmann
T-GEISTSOZ-109048	Social Science A (WiWi)	3 CR	Nollmann
T-GEISTSOZ-109049	Social Science B (WiWi)	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 Customer Relationship Management [M-WIWI-101422]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre) (Usage until 3/31/2020)
Compulsory Elective Modules (Betriebswirtschaftslehre) (Usage until 3/31/2020)

Credits	Language	Level	Version
9	German	3	5

Mandatory			
T-WIWI-102597	Operative CRM	4,5 CR	Geyer-Schulz
Election block: Ergänzungsangebot (1 item)			
T-WIWI-109938	Digital Services	4,5 CR	Satzger, Weinhardt
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch

Competence Certificate
This module will be offered for the last time in winter semester 2019/20.

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

Competence Goal
The student

- knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases,
- gains an overview of the market for CRM software,
- designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, …),
- is aware of the problems of protecting the privacy of customers and the implications of privacy law.

Prerequisites
The course "Operative CRM" is compulsory.

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

Content
In this module, analysis methods and techniques for the management and improvement of customer relations are presented. Furthermore, modelling, implementation, introduction, change, analysis and valuation of operative CRM processes are treated. Regarding the first part, we teach analysis methods and techniques suitable for the management and improvement of customer relations. For this goal we treat the principles of customer- and service-oriented management as the foundation of successful customer relationship management. In addition, we show how knowledge of the customer can be used for decision-making at an aggregate level (e.g. planning of sortiments, analysis of customer loyality, …). A basic requirement for this is the integration and collection of data from operative processes in a suitably defined data-warehouse in which all relevant data is kept for future analysis. The process of transfering data from the operative systems into the data warehouse is known as the ETL process (Extract / Transform / Load). The process of modelling a data-warehouse as well as the so-called extraction, transformation, and loading process for building and maintaining a data-warehouse are discussed in-depth. The data-warehouse serves as a base for flexible management reporting. In addition, various statistic methods (e.g. cluster analysis, regression analysis, stochastic models, …) are presented which help in computing suitable key performance indicators or which support decision-making.
Regaring the operative part, we emphasize the design of operative CRM processes. This includes the modelling, implementation, introduction and change, as well as the analysis and evaluation of operative CRM processes. Petri nets and their extensions are the scientific foundation of process modelling. The link of Petri nets to process models used in industry as e.g. UML activity diagrams is presented. In addition, a framework for process innovation which aims at a radical improvement of key business processes is introduced. The following application areas of operative CRM processes are presented and discussed:
Strategic marketing processes
Operative marketing processes (campaign managament, permission marketing, …)
Customer service processes (sales force management, field services, call center management, …)

Workload

The total amount of work for this module is approximately 270 hours (9 credits). The subdivision is based on the credits of the courses of the module.

The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam periods and the time that is required to achieve the objectives of the module as an average student with an average performance.

M   5.67 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 (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	German	4	3

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

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 5.68 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 (Vertiefungsprogramm Volkswirtschaftslehre)
	Compulsory Elective Modules (Volkswirtschaftslehre)
	Compulsory Elective Modules (Statistik)

Credits	Language	Level	Version
9	German	3	2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-103063	Analysis of Multivariate Data	4,5 CR	Grothe
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller
T-WIWI-103066	Data Mining and Applications	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 seperately.

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

Competence Goal

The student

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

Content

The courses provide a solid Econometric and statistical foundation of techiques 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 5.69 Module: Strategy and Organization [M-WIWI-101425]

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

Credits	**Language**	**Level**	**Version**
9	German	3	4

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

Competence Certificate

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

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

Competence Goal

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

Content

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

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

Workload

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

M 5.70 Module: Supply Chain Management [M-WIWI-101421]

Responsible:	Prof. Dr. Stefan Nickel
Organisation:	KIT Department of Economics and Management
Part of:	Compulsory Elective Modules (Betriebswirtschaftslehre)

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

Mandatory			
T-WIWI-109936	Platform Economy	4,5 CR	Weinhardt
Election block: Ergänzungsangebot (1 item)			
T-WIWI-102704	Facility Location and Strategic Supply Chain Management	4,5 CR	Nickel
T-WIWI-102714	Tactical and Operational Supply Chain Management	4,5 CR	Nickel
T-MACH-102089	Logistics - Organisation, Design and Control of Logistic Systems	6 CR	Furmans
T-WIWI-109802	Wildcard Supply Chain Management	4,5 CR	
T-WIWI-109803	Wildcard Supply Chain Management	4,5 CR	

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 courseT-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 5.71 Module: Technical Logistics [M-MACH-101279]

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

Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	German	3	3

Mandatory			
T-MACH-109919	Basics of Technical Logistics I	4 CR	Mittwollen, Oellerich
T-MACH-109920	Basics of Technical Logistics II	5 CR	

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

M   5.72 Module: Topics in Finance I [M-WIWI-101465]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	1 semester	German/English	3	7

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

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

Content

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

Annotation

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

Workload

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

M 5.73 Module: Topics in Finance II [M-WIWI-101423]

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

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-107505	Financial Accounting for Global Firms	4,5 CR	Luedecke
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-108711	Basics of German Company Tax Law and Tax Planning	4,5 CR	Gutekunst, Wigger
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-110511	Strategic Finance and Technoloy Change	1,5 CR	Ruckes

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

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

Content

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

Annotation

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

Workload

The total workload for this module is approximately 270 hours.

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

Exams					
WS 19/20	7900046	Sicherheit	Prüfung (PR)	Volkamer
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

Competence Certificate
The alternative exam assessment consists of:

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

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

Prerequisites
None

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

T 6.2 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
	M-WIWI-101628 - Emphasis in Informatics
	M-WIWI-101630 - Electives in Informatics

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

Events					
WS 19/20	2512100	Security	4 SWS	Practical course (P)	Baumgart, Volkamer, Mayer, Zarei
Exams					
WS 19/20	7900046	Sicherheit		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)**

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

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

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

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

Events					
WS 19/20	2512551	Practical lab Security, Usability and Society	3 SWS	Practical course (P)	Volkamer, Mayer
Exams					
WS 19/20	7900116	Advanced Lab Security, Usability and Society		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)**

Notes

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

T   6.4 Course: Advanced Lab User Studies in Security [T-WIWI-109271]

Responsible:	Prof. Dr. Melanie Volkamer
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101426 - Electives in Informatics
	M-WIWI-101628 - Emphasis in Informatics
	M-WIWI-101630 - Electives in Informatics

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

Events					
SS 2019	2512552	Praktikum User Studies in Security and Privacy	3 SWS	Practical course (P)	Volkamer, Gerber, Mayer
Exams					
SS 2019	7900129	Advanced Lab User Studies in Security		Prüfung (PR)	Volkamer

Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

T   6.5 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-101399 - Emphasis Informatics
	M-WIWI-105112 - Applied Informatics

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

Events					
WS 19/20	2511026	Advanced Programming - Application of Business Software	2 SWS	Lecture (V)	Klink
WS 19/20	2511027	Exercises Advanced Programming - Application of Business Software	1 SWS	Practice (Ü)	Klink, Ullrich, Schreiber
WS 19/20	2511028	Computer lab Advanced Programming - Application of Business Software	2 SWS	Practice (Ü)	Ullrich, Schreiber
Exams					
SS 2019	7900049	Advanced Programming - Application of Business Software		Prüfung (PR)	Klink
WS 19/20	7900019	Advanced Programming - Application of Business Software		Prüfung (PR)	

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)

Notes

Business information systems enable, support, and accelerate new forms of business processes and forms of organisation. They are the central infrastucture 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)

T   6.6 Course: Advanced Programming - Java Network Programming [T-WIWI-102747]

Responsible: Prof. Dr. Dietmar Ratz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Emphasis Informatics
M-WIWI-105112 - Applied Informatics

Type Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 3

Events					
SS 2019	2511020	Advanced Programming - Java Network Programming	2 SWS	Lecture (V)	Ratz
SS 2019	2511021	Tutorium zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	1 SWS	Tutorial (Tu)	Ratz, Struppek, Ulrich
SS 2019	2511023	Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java	2 SWS		Ratz, Struppek, Ulrich
Exams					
SS 2019	7900041	Advanced Programming - Java Network Programming		Prüfung (PR)	Ratz
WS 19/20	7900020	Advanced Programming - Java Network Programming		Prüfung (PR)	

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   Lecture (V)
2511020, SS 2019, 2 SWS, Language: German, Open in study portal

Learning 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.

Annotation

The registration for the participation in the computer lab (precondition for the exam participation) already takes place in the first lecture week!

Workload

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

Literature

D. Ratz, J. Scheffler, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 6. aktualisierte und erweiterte Auflage, Hanser 2011.

Elective literature:

- 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.
- Further references will be given in the lecture.

T 6.7 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 2019	2520527	Advanced Topics in Economic Theory	2 SWS	Lecture (V)	Mitusch, Scheffel
SS 2019	2520528	Übung zu Advanced Topics in Economic Theory	1 SWS	Practice (Ü)	Pegorari
Exams					
SS 2019	00227	Advanced Topics in Economic Theory		Prüfung (PR)	Mitusch, Scheffel
SS 2019	7900291	Advanced Topics in Economic Theory		Prüfung (PR)	Mitusch, Scheffel

Competence Certificate

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

The assessment consists of a written exam (60min) (following §4(2), 1 of the examination regulation) at the end of the lecture period or at the beginning of the following semester.

Prerequisites
None

Recommendation

This course is designed for advanced Master students with a strong interest in economic theory and mathematical models. Bachelor students who would like to participate are free to do so, but should be aware that the level is much more advanced than in other courses of their curriculum.

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

V Advanced Topics in Economic Theory
2520527, SS 2019, 2 SWS, Language: English, Open in study portal

Lecture (V)

Learning Content

The course deals with basic elements of modern economic theory. It is divided into two parts. The first part introduces the microeconomic foundations of general equilibrium á la Debreu ("The Theory of Value", 1959) and Hildenbrand/Kirman ("Equilibrium Analysis",1988). The second part deals with asymmetric information and introduces the basic techniques of contract theory.
The course is largely based on the textbook "Microeconomic Theory" (Chapters 1-5, 10, 13-20) by A.Mas-Colell, M.D.Whinston, and J.R.Green.

Workload

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

Literature

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

T 6.8 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 Oral examination	**Credits** 4	**Recurrence** Each summer term	**Version** 3

Events					
SS 2019	2122300	Agile product innovation management - value-driven planning of new products	SWS	Lecture (V)	Kläger
Exams					
SS 2019	76-T-MACH-106744	Agile Product Innovation Management - Value-driven Planning of new Products		Prüfung (PR)	Kläger

Competence Certificate
Oral examination, 20 min.

Prerequisites
None

T 6.9 Course: Analalysis of Social Structurs (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	Analysis of Social Structures	2 SWS	Practice (Ü)	Nollmann

T 6.10 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 2019	2134150	Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines	2 SWS	Lecture (V)	Gohl
Exams					
SS 2019	76--T-Mach-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines	Prüfung (PR)	Gohl
WS 19/20	76-T-MACH-105173	Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines	Prüfung (PR)	Koch

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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
Media:

Lecture with Powerpoint slides

Learning Content
The students get involved in the application of different measurement techniques in the field of exhaust gas and lubricating oil analysis. The functional principles of the systems as well as the application areas of the latter are discussed. In addition to a general overview of standard applications, current specific development and research activities are introduced.

Workload
regular attendance: 24 hrs

self study: 96 hrs

Literature
The lecture documents are distributed during the courses.

T 6.11 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-101599 - Statistics and Econometrics
	M-WIWI-101608 - Statistics and Econometrics

Type Written examination	**Credits** 4,5	**Recurrence** Irregular	**Version** 1

Events					
WS 19/20	2550550		2 SWS	Lecture (V)	Grothe
WS 19/20	2550551		2 SWS	Practice (Ü)	Grothe, N.N.

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)**

Learning Content

Multivariate Data
Basics of multivariate estimating and testing
Correlation Analysis
Variance Analysis
Factor- and Principal Component Analysis
Discriminant function analysis
Cluster Analysis

Literature

Comprehensive lecture notes

T	**6.12 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 2019	2134134	Analysis tools for combustion diagnostics	2 SWS	Lecture (V)	Pfeil
Exams					
WS 19/20	76-T-MACH-105167	Analysis Tools for Combustion Diagnostics		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**	Lecture (V)
	2134134, SS 2019, 2 SWS, Language: German, Open in study portal	

Learning Content
energy balance at the engine

energy conversion in the combustion chamber

thermodynamics of the combustion process

flow velocities

flame propagation

special measurement techniques

Workload
regular attendance: 24 hours
self-study: 96 hours

Literature
Lecture notes available in the lectures

T 6.13 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 Written examination	**Credits** 4,5	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2511314	Applications of Artificial Intelligence	2 SWS	Lecture (V)	Sure-Vetter
WS 19/20	2511315	Exercises to Applied Informatics – Applications of Artificial Intelligence	1 SWS	Practice (Ü)	Sure-Vetter, Weller
Exams					
WS 19/20	7900091	Applied Informatics - Applications of Artificial Intelligence		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)**

Notes

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

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

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

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

Learning objectives:

The students

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

Workload:

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

| **V** | **Exercises to Applied Informatics – Applications of Artificial Intelligence**
 2511315, WS 19/20, 1 SWS, Language: German, Open in study portal | **Practice (Ü)** |

Notes

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 6.14 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 2019	2511200	Database Systems	2 SWS	Lecture (V)	Sommer
SS 2019	2511201	Übungen zu Datenbanksysteme	1 SWS	Practice (Ü)	Sommer
Exams					
WS 19/20	7900006	Applied Informatics - Database Systems		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 Database Systems
2511200, SS 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Learning 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).

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam &1h

Total: 150h

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.

Further literature will be given individually.

T   6.15 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2511550	Information Security	2 SWS	Lecture (V)	Volkamer
SS 2019	2511551	Exercise Information Security	1 SWS	Practice (Ü)	Volkamer, Mayer
Exams					
WS 19/20	7900074	Applied Informatics - Information Security		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   Information Security
2511550, SS 2019, 2 SWS, Open in study portal   **Lecture (V)**

Description

- 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 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.

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

T 6.16 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	Applied Informatics - Modelling	2 SWS	Lecture (V)	Oberweis, Sure-Vetter, Schiefer
WS 19/20	2511031	Exercises to Applied Informatics - Modelling	1 SWS	Practice (Ü)	Oberweis, Sure-Vetter, Schiefer, Käfer
Exams					
WS 19/20	7900003	Applied Informatics - Modelling		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**	**Lecture (V)**
	2511030, WS 19/20, 2 SWS, Language: German, Open in study portal	

Notes

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

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

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

Learning objectives:

Students

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

Workload:

- Total effort: 120-150 hours
- Presence time: 45 hours
- Self study: 75-105 hours

V	**Exercises to Applied Informatics - Modelling** 2511031, WS 19/20, 1 SWS, Language: German, Open in study portal	**Practice (Ü)**

Notes

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

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

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

Learning objectives:

Students

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

6 COURSES

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

T   6.17 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-101628 - Emphasis in Informatics
M-WIWI-101630 - Electives in Informatics
M-WIWI-105112 - Applied Informatics

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

Events					
SS 2019	2511032	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	2 SWS	Lecture (V)	Sunyaev
SS 2019	2511033	Übungen zu Angewandte Informatik II – Internet Computing	1 SWS	Practice (Ü)	Sunyaev
Exams					
WS 19/20	7900004	Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	Prüfung (PR)		Sunyaev

Competence Certificate
The assessment consists of a written exam (120 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 II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services
Lecture (V)
2511032, SS 2019, 2 SWS, Language: German, Open in study portal

Learning 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

6 COURSES

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

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

Literature
Tba in the lecture.

T 6.18 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2511206	Software Engineering	2 SWS	Lecture (V)	Oberweis
SS 2019	2511207	Übungen zu Software Engineering	1 SWS	Practice (Ü)	Oberweis, Fritsch
Exams					
WS 19/20	7900026	Applied Informatics - Software Engineering		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 Software Engineering
2511206, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Learning Content
The course deals with fundamental aspects of the systematically 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.

Workload
Lecture 30h
Exercise 15h

Review und Preparation of lectures 30h
Review and Preparation of exercises 15h
Exam preparation 29h
Exam 1h

Total: 120h

Literature

- H. Balzert. Lehrbuch der Software-Technik. Spektrum Verlag 2008.
- I. Sommerville. Software Engineering. Pearson Studium 2012.

Further literature is given in the course.

T 6.19 Course: Auction & Mechanism Design [T-WIWI-102876]

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

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

Events					
SS 2019	2560550	Auction and Mechanism Design	2 SWS	Lecture (V)	Szech
SS 2019	2560551	Übung zu Auction and Mechanism Design	1 SWS	Practice (Ü)	Szech, Huber
Exams					
SS 2019	7900161	Auction & Mechanism Design		Prüfung (PR)	Szech
SS 2019	7900207	Exam Auction & Mechanism Design (2)		Prüfung (PR)	Szech

Competence Certificate

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

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

Prerequisites

None

Recommendation

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

Annotation

The lecture will be held in English.

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

V Auction and Mechanism Design
2560550, SS 2019, 2 SWS, Language: English, Open in study portal   Lecture (V)

Learning 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.

Annotation

The lecture will be held in English.

Workload

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

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   6.20 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

Exams				
SS 2019	2600-10001	....		Lützkendorf
SS 2019	2600-10002	Urban freight transport		Mitusch
SS 2019	2600-10003	Power to Gas: Ökonomische Studie zur lokalen Wasserstoffproduktion im Tankstellenbetrieb mit Hilfe von Elektrolyseuren		Weinhardt
SS 2019	2600-10004	Drivers of Innovation in Clean Energy Technologies – Analyses based on structured and unstructured data		Ott
SS 2019	2600-10005	Variance Risk Premia on German Government Bond Markets		

Competence Certificate
See module description

Prerequisites
See module description

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

Submission deadline	6 months
Maximum extension period	1 months
Correction period	8 weeks

Recommendation
See module description

Annotation
See module description

T   6.21 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2560280	Basic Principles of Economic Policy	2 SWS	Lecture (V)	Ott
SS 2019	2560281	Exercises of Basic Principles of Economic Policy	1 SWS	Practice (Ü)	Ott, Scheu, Bälz
Exams					
SS 2019	7900106	Basic Principles of Economic Policy		Prüfung (PR)	Ott

Competence Certificate

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

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:

V	**Basic Principles of Economic Policy** 2560280, SS 2019, 2 SWS, Language: German, Open in study portal	**Lecture (V)**

Description
Theory of general economic policy and discussion of current economic policy issues:

- 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 Content

- Market interventions: microeconomic and 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

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2015): The Economics of European Integration, McGraw-Hill Education, London
- Lecture slides
- Exercises

V	**Exercises of Basic Principles of Economic Policy** 2560281, SS 2019, 1 SWS, Language: German, Open in study portal	**Practice (Ü)**

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2015): The Economics of European Integration, McGraw-Hill Education, London
- Lecture slides
- Exercises

T 6.22 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	Basics of German Company Tax Law and Tax Planning	3 SWS	Lecture (V)	Wigger, Gutekunst
Exams					
SS 2019	790unbe	Basics of German Company Tax Law and Tax Planning		Prüfung (PR)	Wigger
WS 19/20	790unbe	Basics of German Company Tax Law and Tax Planning		Prüfung (PR)	Wigger

Competence Certificate

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

Prerequisites

None

Recommendation

Knowledge of the collection of public revenues is assumed. Therefore it is recommended to attend the course "Öffentliche Einnahmen" beforehand.

T 6.23 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	Basics of Technical Logistics	3 SWS	Lecture / Practice (VÜ)	Mittwollen, Oellerich
Exams					
WS 19/20	76-T-MACH-109919	Basics of Technical Logistics I		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

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)

Description
Media:

supplementary sheets,presentations, blackboard

Learning 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

Annotation
Basics knowledge of technical mechanics is preconditioned

Workload
presence: 48h

rework: 132h

Literature
Recommendations during lessons

T 6.24 Course: Basics of Technical Logistics II [T-MACH-109920]

Organisation: KIT Department of Mechanical Engineering
Part of: M-MACH-101279 - Technical Logistics

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	1

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

Prerequisites

T   6.25 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 2019	2142883	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	2 SWS	Lecture (V)	Guber
Exams					
SS 2019	76-T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
Media:

Lecture script

Learning Content
Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:
LabCD, Protein Cristallisation
Microarrys
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

Workload
Literature: 20 h

Lessions: 21 h

Preparation and Review: 50 h

Exam preparation: 30 h

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: 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 2019	2142879	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	2 SWS	Lecture (V)	Guber
Exams					
SS 2019	76-T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	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
2142879, SS 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
Media:

Lecture script

Learning 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

Workload
Literature: 20 h

Lessions: 21 h

Preparation and Review: 50 h

Exam preparation: 30 h

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　6.27 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 2019	2142140	Bionics for Engineers and Natural Scientists	2 SWS	Lecture (V)	Hölscher, Walheim, Greiner
Exams					
SS 2019	76-T-MACH-102172	Bionics for Engineers and Natural Scientists	Prüfung (PR)		Hölscher
WS 19/20	76-T-MACH-102172	Bionics for Engineers and Natural Scientists	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 2019, 2 SWS, Language: German, Open in study portal
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　Lecture (V)

Description
Media:

Slides of the lectures

Notes
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 successfull attandence of the lecture is controlled by a written examination.

Learning 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.

Workload
lectures 30 h

self study 30 h

preparation for examination 30 h

Literature
Werner Nachtigall: Bionik – Grundlagen und Beispiele für Ingenieure und Naturwissenschaftler. Springer-Verlag Berlin (2002), 2. Aufl.

| T | **6.28 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	Business Administration: Finance and Accounting	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					
SS 2019	7900036	Business Administration: Finance and Accounting		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

Annotation

Key qualifications can be shown in an active participation through presentations of solutions and discussions in the tutorials which accompany the course. Each part of the course is taught by instructors specialised in the field of that part.

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)** |

Learning Content

- **Investment and Finance:**
  - Valuation of Bonds and Stocks
  - Capital Budgeting
  - Portfolio Theory
- **Financial Accounting**
- **Management Accounting**

Annotation

Key qualifications can be shown in an active participation through presentations of solutions and discussions in the tutorials which accompany the course. Each part of the course is taught by instructors specialised in the field of that part.

Workload

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

Literature

Extensive bibliographic information will be given in the materials to the lecture.

T	**6.29 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 Written examination	Credits 4	Recurrence Each summer term	Version 1

Events					
SS 2019	2500027	Tutorien zu BWL PM	2 SWS	Tutorial (Tu)	Klarmann, Strych, Assistenten
SS 2019	2600024	Business Administration: Production Economics and Marketing	2 SWS	Lecture (V)	Klarmann, Schultmann, Fichtner
Exams					
SS 2019	7900258	Business Administration: Production Economics and Marketing		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 2019, 2 SWS, Language: German, Open in study portal	**Lecture (V)**

Description
1. Marketing:

Marketing is an organizational function to handle situations, activities, and processes for creating, communicating, and delivering value to customers in a best way. (Customer) relationship management comprises collecting, aggregating, and analyzing information (e.g., developements in the society, changing conditions of markets, alterations w.r.t. buying behavior) to benefit different target groups.

Main topics will deal with market research and optimized application of marketing mix instruments with emphasis on 'marketing and the web','innovation management', and 'international marketing'.

2. Production economics

In the part of production economics the student will learn basics in the field of production theory, procurement and resource aquisitions, production and operations management and industrial engineering.

Aspects of electrical engineering industry, technological foresights, construction industry andreal estate markets will be treated.

3. Information systems

In today's economy, information is a competetive factor that calls for an interdisciplinary investigation from economics and business administration, informatics and law. In this part of the lecture, selected topics from information engineering and management and their impact in market competition are presented

Topics include: Information in a company, Information processing: From an agent to business networks, social networks, service value networks, market engineering

Learning Content

The course is made up of the following topics:

Marketing

- Foundations of marketing
- Strategic marketing
- Cosumer behaviour
- Product
- Price
- Promotion
- Sales
- Marketing Metrics

Production economics

In the part of production economics the student will learn basics in the field of production theory, procurement and resource aquisitions, production and operations management and industrial engineering.

Aspects of energy economics, technological foresights, construction industry and real estate markets will be treated.

Annotation

Key qualifications can be shown in an active participation through presentations of solutions and discussions in the tutorials which accompany the course.

Each part of the course is taught by instructors specialised in the field of that part.

Workload

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

Literature

Further literature references are announced in the materials to the lecture.

T 6.30 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					
SS 2019	7900033	Business Administration: Strategic Management and Information Engineering and Management		Prüfung (PR)	Lindstädt, Weinhardt

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 6.31 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	Business Strategies of Banks	2 SWS	Lecture (V)	Müller
Exams					
SS 2019	7900079	Business Strategies of Banks		Prüfung (PR)	Müller

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

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

V Business Strategies of Banks
2530299, WS 19/20, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

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

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

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

Literature
Elective literature:

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

T 6.32 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

Type Completed coursework (practical)	Credits 2	Recurrence Each term	Version 2

Events					
SS 2019	2123357	CAD-NX training course	3 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
WS 19/20	2123357	CAD-NX training course	2 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
Exams					
SS 2019	76-T-MACH-102187	CAD-NX Training Course		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
2123357, SS 2019, 3 SWS, Language: German, Open in study portal

Practical course (P)

Learning Content
The participant will learn the following knowledge:

- 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

Annotation
For the practical course compulsory attendance exists.

Workload
Regular attendance: 35 hours,
Self-study: 12 hours

Literature
Practical course skript

V	**CAD-NX training course**	**Practical course (P)**
	2123357, WS 19/20, 2 SWS, Language: German, Open in study portal	

Learning Content
The participant will learn the following knowledge:

- 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

Annotation
For the practical course compulsory attendance exists.

Workload
Regular attendance: 35 hours,
Self-study: 12 hours

Literature
Practical course skript

T 6.33 Course: Civil Law for Beginners [T-INFO-103339]

Responsible:	Prof. Dr. Thomas Dreier
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101187 - Elective Module Law
	M-INFO-101190 - Introduction to Civil Law

Type	Credits	Recurrence	Version
Written examination	5	Each winter term	2

Events					
WS 19/20	24012	Civil Law for Beginners	4 SWS	Lecture (V)	Matz
Exams					
SS 2019	7500041	Civil Law for Beginners		Prüfung (PR)	Dreier, Matz
WS 19/20	7500012	Civil Law for Beginners		Prüfung (PR)	Matz, Dreier

T   6.34 Course: Climatology [T-PHYS-101092]

Responsible: Prof. Dr. Joaquim José Ginete Werner Pinto
                     Katharina Maurer
Organisation: KIT Department of Physics
Part of: M-WIWI-101646 - Introduction to Natural Hazards and Risk Analysis 1
                     M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
                     M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Recurrence	Version
Completed coursework	5	Each summer term	3

Events					
SS 2019	4051111	Klimatologie	3 SWS	Lecture (V)	Ginete Werner Pinto
SS 2019	4051112	Übungen zu Klimatologie	1 SWS	Practice (Ü)	Ginete Werner Pinto, Ludwig, Mömken
Exams					
SS 2019	7800005	Climatology		Prüfung (PR)	Ginete Werner Pinto

Prerequisites

T 6.35 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 Oral examination	**Credits** 5	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2133113	Combustion Engines I	4 SWS	Lecture / Practice (VÜ)	Koch
Exams					
SS 2019	76-T-MACH-102194	Combustion Engines I		Prüfung (PR)	Koch, Kubach
WS 19/20	76-T-MACH-102194	Combustion Engines I		Prüfung (PR)	Kubach, 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 Combustion Engines I
2133113, WS 19/20, 4 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)

Notes
Introduction, History, Concepts

Working Principle and Applications

Characteristic Parameters

Engine Parts

Drive Train

Fuels

Gasoline Engines

Diesel Engines

Exhaust Gas Aftertreatment

Learning Content
Introduction, History, Concepts

Working Principle and Applications

Characteristic Parameters

Engine Parts

Drive Train

Fuels

Gasoline Engines

Diesel Engines

Exhaust Gas Aftertreatment

Workload
regular attendance: 32 hours
self-study: 88 hours

T 6.36 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 2019	2134151	Combustion Engines II	3 SWS	Lecture / Practice (VÜ)	Koch
Exams					
SS 2019	76-T-MACH-104609	Combustion Engines II		Prüfung (PR)	Koch, Kubach
WS 19/20	76-T-MACH-104609	Combustion Engines II		Prüfung (PR)	Kubach, Koch

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 2019, 3 SWS, Language: German, Open in study portal

Lecture / Practice (VÜ)

Learning Content
Emissions

Fuels

Drive Train Dynamics

Engine Parts

Boosting

Alternative Powertrain Concepts

Special Engine Concepts

Power Transmission

Workload
regular attendance: 31,5 hours
self-study: 90 hours

T 6.37 Course: Competition in Networks [T-WIWI-100005]

Responsible:	Prof. Dr. Kay Mitusch
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101422 - Specialization in Customer Relationship Management
	M-WIWI-101499 - Applied Microeconomics
	M-WIWI-101668 - Economic Policy I

Type Written examination	**Credits** 4,5	**Recurrence** Each winter term	**Version** 3

Events					
WS 19/20	2561204	Competition in Networks	2 SWS	Lecture (V)	Mitusch
WS 19/20	2561205	Übung zu Wettbewerb in Netzen	1 SWS	Practice (Ü)	Wisotzky, Mitusch, Corbo
Exams					
SS 2019	7900274	Competition in Networks		Prüfung (PR)	Mitusch

Competence Certificate
Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC).
Examination is offered every semester and can be retried at any regular examination date.

Prerequisites
None.

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

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

V Competition in Networks
2561204, WS 19/20, 2 SWS, Language: German, Open in study portal

Lecture (V)

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

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

Literature
Will be announced in the lecture.

T   6.38 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	Computer Contract Law	2 SWS	Lecture (V)	Bartsch
Exams					
SS 2019	7500066	Computer Contract Law		Prüfung (PR)	Dreier, Matz
WS 19/20	7500065	Computer Contract Law		Prüfung (PR)	Dreier, Matz

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

V   Computer Contract Law   Lecture (V)
2411604, WS 19/20, 2 SWS, Language: German, Open in study portal

Description

The course deals with contracts from the following areas:

- Contracts of programming, licencing and maintaining software
- Contracts in the field of IT employment law
- IT projects and IT Outsourcing
- Internet Contracts

From these areas single contracts will be chosen and discussed (e.g. software maintenance, employment contract with a software engineer). Concerning the respective contract the technical features, the economic background and the subsumption in the national law of obligation (BGB-Schuldrecht) will be discussed. As a result different contractual clauses will be developed by the students. Afterwards typical contracts and conditions will be analysed with regard to their legitimacy as standard business terms (AGB). It is the aim to show the effects of the german law of standard business terms (AGB-Recht) and to point out that contracts are a means of drafting business concepts and market appearance.

Learning Content

It is the aim of this course to provide students with knowledge in the area of contract formation and formulation in practice that builds upon the knowledge the students have already acquired concerning the legal protection of computer programs. Students shall understand how the legal rules depend upon, and interact with, the economic background and the technical features of the subject. The contract drafts shall be prepared by the students and will be corporately completed during the lecture. It is the aim of the course that students will be able to formulate contracts by themselves.

Literature

- Langenfeld, Gerrit Vertragsgestaltung Verlag C.H.Beck, III. Aufl. 2004
- Heussen, Benno Handbuch Vertragsverhandlung und Vertragsmanagement Verlag C.H.Beck, II. Aufl. 2002
- Schneider, Jochen Handbuch des EDV-Rechts Verlag Dr. Otto Schmidt KG, III. Aufl. 2002

Elective Literature

tba in the transparencies

T 6.39 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 2019	6200410	Construction Technology	3 SWS	Lecture (V)	Gentes, Haghsheno, Schneider
SS 2019	6200411	Exercises to Construction Technology	1 SWS	Practice (Ü)	Gentes, Haghsheno, Schneider, Waleczko
Exams					
SS 2019	8230101691	Construction Technology		Prüfung (PR)	Haghsheno

Competence Certificate
written exam with 90 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 6.40 Course: Control Technology [T-MACH-105185]

Responsible: Christoph Gönnheimer
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 2019	2150683	Control Technology	2 SWS	Lecture (V)	Gönnheimer
Exams					
SS 2019	76-T-MACH-105185	Control Technology		Prüfung (PR)	Fleischer

Competence Certificate
Written Exam (60 min)

Prerequisites
none

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

V Control Technology
2150683, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
Media:

Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

Notes
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

Learning 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

Annotation
None

Workload
regular attendance: 21 hours
self-study: 99 hours

T 6.41 Course: Copyright [T-INFO-101308]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Intellectual Property Law

Type Written examination	Credits 3	Recurrence Each term	Version 1

Events					
WS 19/20	24121	Copyright	2 SWS	Lecture (V)	Dreier
Exams					
SS 2019	7500064	Copyright		Prüfung (PR)	Dreier, Matz
WS 19/20	7500064	Copyright		Prüfung (PR)	Dreier, Matz

T 6.42 Course: Customer Relationship Management [T-WIWI-102595]

Responsible:	Prof. Dr. Andreas Geyer-Schulz
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101460 - CRM and Service Management

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

Events					
WS 19/20	2540508	Customer Relationship Management	2 SWS	Lecture (V)	Geyer-Schulz
WS 19/20	2540509	Übung zu Customer Relationship Management	1 SWS	Practice (Ü)	Schweigert
Exams					
SS 2019	7900279	Customer Relationship Management		Prüfung (PR)	Geyer-Schulz

Competence Certificate

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

Prerequisites

None

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

V Customer Relationship Management
2540508, WS 19/20, 2 SWS, Language: English, Open in study portal

Lecture (V)

Learning Content

The course begins with an introduction into Service Management as the strategic concept which also covers all CRM applications. The course is divided in the basics of Service Management as well as different topics within this concept like external and internal marketing, quality management and organizational requirements.

Workload

The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

Sum: 135h 00m

Literature

Christian Grönroos. Service Management and Marketing : A Customer Relationship Management Approach. Wiley, Chichester, 2nd edition, 2000.

Elective literature:

Jill Dyché. The CRM Handbook: A Business Guide to Customer Relationship Management. Addison-Wesley, Boston, 2nd edition, 2002.

Ronald S. Swift. Accelerating Customer Relationships: Using CRM and RelationshipTechnologies. Prentice Hall, Upper Saddle River, 2001.

Stanley A. Brown. Customer Relationship Management: A Strategic Imperative in theWorld of E-Business. John Wiley, Toronto, 2000.

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-101599 - Statistics and Econometrics
	M-WIWI-101608 - Statistics and Econometrics

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

Events					
SS 2019	2520375	Data Mining and Applications	2/4 SWS	Lecture (V)	Nakhaeizadeh
Exams					
SS 2019	7900102	Data Mining and Applications (Lecture)		Prüfung (PR)	Nakhaeizadeh

Competence Certificate

- Conduction of a larger emprical 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   Lecture (V)
2520375, SS 2019, 2/4 SWS, Language: German, Open in study portal

Learning Content
Part one: Data Mining

Why Data Mining?

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

Part two: Examples of application of Data Mining

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

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

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

- Jiawei Han, Micheline Kamber, Data Mining : Concepts and Techniques, 2nd edition, Morgan Kaufmann, ISBN 1558609016, 2006.
- David J. Hand, Heikki Mannila and Padhraic Smyth, Principles of Data Mining , MIT Press, Fall 2000
- Trevor Hastie, Robert Tibshirani, Jerome Friedman, The Elements of Statistical Learning: Data Mining, Inference, and Prediction, Springer Verlag, 2001.
- Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson Addison wesley (May, 2005). Hardcover: 769 pages. ISBN: 0321321367
- Ripley, B.D. (1996) Pattern Recognition and Neural Networks, Cambridge: Cambridge University Press.
- Ian witten and Eibe Frank, Data Mining: Practical Machine Learning Tools and Techniques, 2nd Edition, Morgan Kaufmann, ISBN 0120884070, 2005.

T 6.44 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	Datenschutzrecht	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500083	Data Protection Law		Prüfung (PR)	Marsch

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

Events					
SS 2019	2520365	Decision Theory	2 SWS	Lecture (V)	Ehrhart
SS 2019	2520366	Übungen zu Entscheidungstheorie	1 SWS	Practice (Ü)	Ehrhart
Exams					
SS 2019	7900254	Decision Theory		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.

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

V Decision Theory
2520365, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
In the first part of the course we deal with problems of decision making under uncertainty and introduce models like expected utility theory, stochastic dominance, risk aversion, and prospect. theory. We also consider the empirical validity of the different approaches.

In the second part the concepts learned in the first part are applied for example to search models and Bayesian games.

Learning Content
This course deals with problems of decision making particularly under uncertainty. We introduce the expected utility theory of Neumann/Morgenstern and the prospect theory of Kahnemann/Tversky and discuss the concepts of stochastic dominance, risk aversion, loss aversion, reference points etc. We also consider the empirical validity of the different approaches. Additionally, the lecture provides an introduction to the theory of findings (epistemology), particularly with respect to decision theory.

Annotation
The course "Decision Theory" [2520365] will not be offered any more in M.Sc. from winter term 2015/2016 on.

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

Literature

- Ehrhart, K.-M. und S.K. Berninghaus (2012): Decision Theory, Script, KIT.
- Hirshleifer und Riley (1997): The Analytics of Uncertainty and Information. London: Cambridge University Press, 4. Edtion.
- Berninghaus, S.K., K.-M. Ehrhart und W. Güth (2006): Strategische Spiele. Berlin u.a.: Springer, 3., Edtion

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

Events					
SS 2019	2530550	Derivatives	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530551	Übungen zu Derivate	1 SWS	Practice (Ü)	Uhrig-Homburg, Eska
Exams					
SS 2019	7900111	Derivatives		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 excercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites
None

Recommendation
None

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

V Derivatives
2530550, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

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

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

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

Literature

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

Elective literature:

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

T 6.47 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	Design and Construction of Buildings	2 SWS	Lecture (V)	Lützkendorf
WS 19/20	2586405	Übung zu Bauökologie I	1 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 (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)

Description
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.

Learning 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.

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

Literature
Elective literature:

See german version.

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 2019	2585403	Übung zu Bauökologie II	1 SWS	Practice (Ü)	Ströbele
SS 2019	2585404	Sustainability Assessment of Buildings	2 SWS	Lecture (V)	Lützkendorf, Ströbele
Exams					
SS 2019	7900178	Design, Construction and Sustainability Assessment of Buildings II		Prüfung (PR)	Lützkendorf
SS 2019	7900194	Design, Construction and Sustainability Assessment of Buildings II		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 (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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
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.

Learning 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.

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

Literature
Elective literature:

See german version.

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-101422 - Specialization in Customer Relationship Management
	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 2019	2595466	Digital Services (formerly Foundations of Digital Services A)	2 SWS	Lecture (V)	Satzger, Weinhardt, Sure-Vetter, Kühl
SS 2019	2595467	Exercise Digital Services (formerly Foundations of Digital Services A)	1 SWS	Practice (Ü)	Hirt, Kloker
Exams					
SS 2019	00016	Foundations of 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 (formerly Foundations of Digital Services A)
2595466, SS 2019, 2 SWS, Language: English, Open in study portal
Lecture (V)

Description

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.

Learning 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.

Annotation
Former title "Foundations of Digital Services A"

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

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: Dr. 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	Digitalization from Production to the Customer in the Optical Industry	2 SWS	Lecture (V)	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)

Description
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

Notes

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

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

Events					
WS 19/20	2560137	Economics and Behavior	2 SWS	Lecture (V)	Ehrlich, Puppe
WS 19/20	2560138	Übung zu Economics and Behavior	1 SWS	Practice (Ü)	Ehrlich

Competence Certificate

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

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

Prerequisites

None

Recommendation

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

Annotation

The lecture will be held in English.

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

V Economics and Behavior
2560137, WS 19/20, 2 SWS, Language: English, Open in study portal

Lecture (V)

Learning 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.

Annotation

The lecture will be held in English.

Workload

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

Literature

Kahnemann, Daniel: Thinking, Fast and Slow. Farrar, Straus and Giroux, 2011.

Ariely, Dan: Predictably irrational. New York: Harper Collins, 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-101606 - Economics
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	Economics I: Microeconomics	3 SWS	Lecture (V)	Puppe
WS 19/20	2610013		2 SWS	Tutorial (Tu)	Puppe, Müller

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 descritpion 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)

Description

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.

Workload
The total workload for this course is approximately 150 hours.

Literature

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

T   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-101606 - Economics
	M-WIWI-105204 - Economics

Type Written examination	**Credits** 5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2560015	Economics II : Macroeconomics, Tutorial	2 SWS	Tutorial (Tu)	Wigger, Zimmermann
SS 2019	2600014	Economics II: Macroeconomics	4 SWS	Lecture (V)	Wigger
Exams					
SS 2019	7900215	Economics II: Macroeconomics		Prüfung (PR)	Wigger
WS 19/20	790vwl2	Economics II: Macroeconomics		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 2019, 4 SWS, Language: German, Open in study portal   Lecture (V)

Learning 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

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

This lecture is based on the well-known textbook "Macroeconomics" by Greg Mankiw from Schäffer Poeschel Verlag in the current version.

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-101599 - Statistics and Econometrics
	M-WIWI-101606 - Economics
	M-WIWI-105203 - Introduction in Econometrics

Type Written examination	**Credits** 5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2520016	Economics III: Introduction in Econometrics	2 SWS	Lecture (V)	Schienle
SS 2019	2520017	Übungen zu VWL III	2 SWS	Practice (Ü)	Schienle, Buse
Exams					
SS 2019	7900119	Economics III: Introduction in Econometrics		Prüfung (PR)	Schienle
SS 2019	7900225	Economics III: Introduction in Econometrics		Prüfung (PR)	Schienle

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 in Econometrics
2520016, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Learning Content
Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)

Multi equation models

Dynamic models

Workload
180 hours (6.0 Credits)

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

Elective literature:

Additional literature will be suggested in course

T 6.55 Course: eFinance: Information Systems for Securities Trading [T-WIWI-109941]

Responsible:	Prof. Dr. Christof Weinhardt
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-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 Written examination	**Credits** 4,5	**Recurrence** Each winter term	**Version** 2

Events

WS 19/20	2540454	eFinance: Information Systems for Securities Trading	2 SWS	Lecture (V)	Weinhardt, Notheisen
WS 19/20	2540455	Übungen zu eFinance: Wirtschaftsinformatik für den Wertpapierhandel	1 SWS	Practice (Ü)	Jaquart, Soufi

Competence Certificate

Success is monitored by means of ongoing elaborations and presentations of tasks and an examination (60 minutes) at the end of the lecture period. The scoring scheme for the overall evaluation will be announced at the beginning of the course.

Prerequisites

see below

Recommendation

None

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

V eFinance: Information Systems for Securities Trading

2540454, WS 19/20, 2 SWS, Language: English, Open in study portal

Lecture (V)

Description

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

Learning Content

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

Workload

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

Literature

- Picot, Arnold, Christine Bortenländer, Heiner Röhrl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners"". Oxford University Press, New York

Elective literature:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg
- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

T 6.56 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 2019	2307391	Electric Energy Systems	2 SWS	Lecture (V)	Leibfried
SS 2019	2307393	Übungen zu 2307391 Elektroenergiesysteme	1 SWS	Practice (Ü)	Görtz
Exams					
SS 2019	7307391	Electric Energy Systems		Prüfung (PR)	Leibfried

Prerequisites

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	Empirical Finance	4 SWS	Lecture (V)	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)

Description
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.

Learning Content
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

Workload
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 Written examination	Credits 3	Recurrence Each term	Version 1

Events					
WS 19/20	24167	Employment Law I	2 SWS	Lecture (V)	Hoff
Exams					
SS 2019	7500097	Employment Law I		Prüfung (PR)	Dreier, Matz
WS 19/20	7500040	Employment Law I		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 Written examination	Credits 3	Recurrence Each term	Version 1

Events					
SS 2019	24668	Employment Law II	2 SWS	Lecture (V)	Hoff
Exams					
SS 2019	7500098	Employment Law II		Prüfung (PR)	Dreier, Matz
WS 19/20	7500058	Employment Law II		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	Energy Conversion and Increased Efficiency in Internal Combustion Engines	2 SWS	Lecture (V)	Koch
Exams					
SS 2019	76-T-MACH-105564	Energy Conversion and Increased Efficiency in Internal Combustion Engines		Prüfung (PR)	Koch, Kubach
WS 19/20	76-T-MACH-105564	Energy Conversion and Increased Efficiency in Internal Combustion Engines		Prüfung (PR)	Koch

Competence Certificate
oral exam, 25 minutes, no auxillary means

Prerequisites
none

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

V Energy Conversion and Increased Efficiency in Internal Combustion Engines
2133121, WS 19/20, 2 SWS, Language: German, Open in study portal   Lecture (V)

Notes
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

Learning 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

Workload

regular attendance: 24 hours, self-study: 96 hours

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

Events					
SS 2019	2581959	Energy Policy	2 SWS	Lecture (V)	Wietschel
Exams					
SS 2019	7981959	Energy Policy		Prüfung (PR)	Fichtner

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

Prerequisites
None.

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

V Energy Policy
2581959, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

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

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

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

Literature
Will be anounced in the lecture.

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 2019	2134137	Engine measurement techniques	2 SWS	Lecture (V)	Bernhardt
Exams					
SS 2019	76-T-MACH-105169	Engine Measurement Techniques		Prüfung (PR)	Koch
WS 19/20	76-T-MACH-105169	Engine Measurement Techniques		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 2019, 2 SWS, Language: German, Open in study portal   Lecture (V)

Learning Content
Students get to know state-of-the-art measurement techniques for combustion engines. In particular basic techniques for measuring engine operating parameters such as torque, speed, power and temperature.

Possible measurement errors and abberations are discussed.

Furthermore techniques for measuring exhaust emissions, air/fuel ratio, fuel consumption as well as pressure indication for thermodynamic analysis are covered.

Workload
regular attendance: 21 hours
self-study: 100 hours

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:	Prof. Dr. Matthias Bäcker
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101217 - Public Business Law

Type Written examination	Credits 3	Recurrence Each term	Version 1

Events					
WS 19/20	24140	Umweltrecht	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500082	Environmental Law		Prüfung (PR)	Marsch

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

Events					
SS 2019	24666	Europäisches und Internationales Recht	2 SWS	Lecture (V)	Brühann
Exams					
SS 2019	7500084	European and International Law		Prüfung (PR)	Marsch

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-101646 - Introduction to Natural Hazards and Risk Analysis 1
M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Recurrence	Version
Written examination	1	Each summer term	4

Exams				
SS 2019	7800052	Exam on Climatology as Minor Subject	Prüfung (PR)	Ginete Werner Pinto

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 Examination of another type	Credits 9	Recurrence Each term	Version 2

Events					
SS 2019	24504	Advanced Civil Law	2 SWS	Lecture (V)	Matz
SS 2019	24506	Exercises in Civil Law	2 SWS	Lecture (V)	Dreier
SS 2019	24926	Case Studies in Civil Law	2 SWS	Practice (Ü)	Kleiner, Käde
WS 19/20	24011	Commercial and Corporate Law	2 SWS	Lecture (V)	Wiele
Exams					
SS 2019	7500099	Wirtschaftsprivatrecht		Prüfung (PR)	Dreier, Matz
WS 19/20	7500108	Commercial Law		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					
SS 2019	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 2019	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
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
Exams					

SS 2019	7800001	Experimental Physics	Prüfung (PR)	Schimmel

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

Exams				
SS 2019	7900233	Facility Location and Strategic Supply Chain Management	Prüfung (PR)	Nickel

Competence Certificate

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

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

The exam takes place in every semester.

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

Prerequisites

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

Recommendation

None

Annotation

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

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 Written examination	**Credits** 4	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2600002		2 SWS	Lecture (V)	Strych
WS 19/20	2600003	Übung zu Rechnungswesen	2 SWS	Practice (Ü)	Strych
Exams					
SS 2019	7900040	Financial Accounting and Cost Accounting		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 eyery 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)**

Learning Content

1. Introduction to accounting standards (IFRS, HGB)

2. Annual report and financial statements

3. Selected topics in financial accounting

4. Operational efficiency analysis

5. Financial Statement Analysis

6. Value-based management

7. Taxes

8. Creative accounting and compliance

9. Budgeting and benchmarking

10. Reporting

Annotation
It is recommended to have some skills about financial accounting on an introductory level.

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

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	Financial Accounting for Global Firms	2 SWS	Lecture (V)	Luedecke
WS 19/20	2530243	Übung zu Financial Accounting for Global Firms	SWS	Practice (Ü)	Luedecke
Exams					
SS 2019	7900195	Financial Accounting for Global Firms		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)

Description
Increasing globalization coupled with related regulations continues to put pressure on moving towards a common global accounting framework - International Financial Reporting Standards (IFRS). Currently, more than 100 countries use IFRS, so if a firm's business include global transactions, it is critical to know about the impact of IFRS on the financial reporting process and business. In the EU, IFRS are compulsory for listed companies's consolidated statements but have also gained factual significance for companies without statutory duty to use IFRS. The course introduces the conceptual framework of IFRS, discuss the primary financial statements according to IFRS and explains the underlying principles, concepts, and methods to prepare the financial statements. Special focus is given to some more complex accounting issues related to revenue recognition from contracts with customers, consolidation of different types of intercorporate investments, and foreign currency translation.

Learning Content

The lecture covers the following topics:

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

Literature

Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.

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-101599 - Statistics and Econometrics
	M-WIWI-101608 - Statistics and Econometrics

Type	Credits	Recurrence	Version
Written examination	4,5	Irregular	2

Competence Certificate

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

Prerequisites

None

Recommendation

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

Annotation

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

T 6.72 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 Written examination	**Credits** 4,5	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2530232	Financial Intermediation	2 SWS	Lecture (V)	Ruckes
WS 19/20	2530233	Übung zu Finanzintermediation	1 SWS	Practice (Ü)	Ruckes, Hoang, Benz
Exams					
SS 2019	7900078	Financial Intermediation		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   Lecture (V)
2530232, WS 19/20, 2 SWS, Language: German, Open in study portal

Description

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

Learning Content

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

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

Literature
Elective literature:

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

T   6.73 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2530216	Financial Management	2 SWS	Lecture (V)	Ruckes
SS 2019	2530217	Übung zu Financial Management	1 SWS	Practice (Ü)	Ruckes, Schubert
Exams					
SS 2019	7900074	Financial Management		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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
Analytical methods and theories in the field 'Capital investments and financing' with the main focus on:

- Capital Structure
- Dividend policy
- Essentials of valuation
- Investment decisions
- Short term/ long term finance
- Working Capital Management

Learning Content
Analytical methods and theories in the field of corporate finance with the main focus on:

- Liquidity and Working Capital Management
- Sources of short term/ long term finance
- Capital Structure
- Dividend policy

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

Literature
Elective literature:

- Ross, Westerfield, Jaffe, Jordan (2009): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2016): Corporate Finance, 4th 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 Written examination	**Credits** 5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2511010	Foundations of Informatics I	2 SWS	Lecture (V)	Sure-Vetter, Färber
SS 2019	2511011	Exercises to Foundations of Informatics I	SWS	Practice (Ü)	Sure-Vetter, Nguyen, Weller
Exams					
SS 2019	7900035	Foundations of Informatics I		Prüfung (PR)	Sure-Vetter
WS 19/20	7900011	Foundations of Informatics I		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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
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.

Learning Content
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

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 preperation: 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.

Additional literature will be announced in the lecture.

V **Exercises to Foundations of Informatics I** 2511011, SS 2019, SWS, Language: German, Open in study portal	**Practice (Ü)**

Description
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.

Learning Content
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

Workload
The total workload for the lecture Foundations of Informatics I is given out on the description of the lecture.

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.

Additional literature will be announced in the lecture.

T 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	Foundations of Informatics II	3 SWS	Lecture (V)	Landesberger von Antburg
WS 19/20	2511013	Tutorien zu Grundlagen der Informatik II	1 SWS	Tutorial (Tu)	Landesberger von Antburg
Exams					
SS 2019	7900050	Foundations of Informatics II		Prüfung (PR)	Sure-Vetter
WS 19/20	7900012	Foundations of Informatics II		Prüfung (PR)	Landesberger von Antburg

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* [2511010] beforehand.
Active participation in the practical lessons is strongly recommended.

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

V Foundations of Informatics II
2511012, WS 19/20, 3 SWS, Language: German, Open in study portal

Lecture (V)

Notes

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), programing 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.

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

Events					
SS 2019	2540560	Foundations of Interactive Systems	3 SWS	Lecture (V)	Mädche
Exams					
SS 2019	7900247	Foundations of Interactive Systems		Prüfung (PR)	Mädche

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

Prerequisites
None

Recommendation
None

Annotation
New course starting summer term 2019.

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

| V | **Foundations of Interactive Systems**
2540560, SS 2019, 3 SWS, Language: English, Open in study portal | **Lecture (V)** |

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

With the continuous growing capabilities of computers, the design of the interaction between human and computer becomes even more important. This lecture introduces foundations on design processes and principles for interactive systems.

The lecture focuses on foundational concepts, theories, practices and methods for the design of interactive systems. The students get the foundational knowledge to guide the design of interactive systems in business and private life.

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-101399 - Emphasis Informatics
	M-WIWI-101426 - Electives in Informatics

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

Events					
SS 2019	2511226	Grundlagen für mobile Business	2 SWS	Lecture (V)	Schiefer
SS 2019	2511227	Übungen zu Grundlagen für mobile Business	1 SWS	Practice (Ü)	Schiefer
Exams					
SS 2019	7900001	Foundations of mobile Business		Prüfung (PR)	Oberweis
WS 19/20	7900118	Foundations of mobile Business		Prüfung (PR)	Oberweis

Competence Certificate

The assessment of this course is a written (60 min.) or (if necessary) oral examination according to §4(2) of the examination regulation.

Prerequisites

None

Annotation

Lecture and exercises are integrated.

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	Fuels and Lubricants for Combustion Engines	2 SWS	Lecture (V)	Kehrwald
Exams					
SS 2019	76-T-MACH-105184	Fuels and Lubricants for Combustion Engines		Prüfung (PR)	Kehrwald
WS 19/20	76-T-MACH-105184	Fuels and Lubricants for Combustion Engines		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   Lecture (V)
2133108, WS 19/20, 2 SWS, Language: German, Open in study portal

Notes
Introduction and basics

Fuels for Gasoline and Diesel engines

Hydrogen

Lubricants for Gasoline and Diesel engines

Coolants for combustion engines

Learning Content
Introduction and basics

Fuels for Gasoline and Diesel engines

Hydrogen

Lubricants for Gasoline and Diesel engines

Coolants for combustion engines

Workload
regular attendance: 24 hours
self-study: 96 hours

Literature
Lecturer notes

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 2019	2134138	Fundamentals of catalytic exhaust gas aftertreatment	2 SWS	Lecture (V)	Lox, Grunwaldt, Deutschmann
Exams					
SS 2019	76-T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment		Prüfung (PR)	Lox
WS 19/20	76-T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment		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 2019, 2 SWS, Language: German, Open in study portal   Lecture (V)

Learning Content
1. kind and source of emissions
2. emission legislation
3. principal of catalytic exhaust gas aftertreatment (EGA)
4. EGA at stoichiometric gasoline engines
5. EGA at gasoline engines with lean mixtures
6. EGA at diesel engines
7. economical basic conditions for catalytic EGA

Workload
regular attendance: 36 hours
self-study: 84 hours

Literature
Lecture notes available in the lectures

1. ''Environmental Catalysis'' Edited by G.Ertl, H. Knötzinger, J. Weitkamp Wiley-VCH Verlag GmbH, Weinheim, 1999 ISBN 3-527-29827-4
2. ''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
3. ''Catalytic Air Pollution Control - commercial technology'' R. M. Heck, R. J. Farrauto John Wiley & Sons, Inc., USA, 1995 ISBN 0-471-28614-1
4. ''Automobiles and Pollution'' P. Degobert Editions Technic, Paris, 1995 ISBN 2-7108-0676-2
5. ''Reduced Emissions and Fuel Consumption in Automobile Engines'' F. Schaeder, R. van Basshuysen, Springer Verlag Wien New York, 1995 ISBN 3-211-82718-8
6. ''Autoabgaskatalysatoren : Grudlagen - 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 2019	2581950	Fundamentals of Production Management	2 SWS	Lecture (V)	Schultmann
SS 2019	2581951	Übungen Grundlagen der Produktionswirtschaft	2 SWS	Practice (Ü)	Müller, Naber
Exams					
SS 2019	7981950	Fundamentals of Production Management		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 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
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 with respect to supply chain management and disposal logistics.

Medien und Pflichtliteratur: können aus der alten Fassung übernommen werden.

Learning 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 with respect to supply chain management and disposal logistics.

Workload
Total effort required will account for approximately 165h (5.5 credits).

Literature
will be announced in the course

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

Competence Certificate

Oral examination, duration 25 min., no auxillary means

Prerequisites

T   6.82 Course: Gear Cutting Technology [T-MACH-102148]

Responsible: Dr. Markus Klaiber
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	2149655	Gear Technology	2 SWS	Lecture (V)	Klaiber
Exams					
SS 2019	76-T-MACH-102148	Gear Cutting Technology		Prüfung (PR)	Schulze

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

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes
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

Learning 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.

Workload
regular attendance: 21 hours
self-study: 99 hours

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

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 Examination of another type	Credits 8	Recurrence Each winter term	Version 2

Events					
WS 19/20	4060121	Geological Hazards and Risk	2 SWS	Lecture (V)	Gottschämmer, Daniell
WS 19/20	4060122	Exercises on Geological Hazards and Risk	2 SWS	Practice (Ü)	Gottschämmer, Daniell
Exams					
WS 19/20	7800114	Geological Hazards and Risk		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

Events					
SS 2019	2550134	Globale Optimierung I	2 SWS	Lecture (V)	Stein
SS 2019	2550135	Übungen zu Globale Optimierung I+II	1 SWS	Practice (Ü)	Stein
Exams					
SS 2019	7900061_SS2019_HK	Global Optimization I		Prüfung (PR)	Stein

Competence Certificate

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

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

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

Prerequisites
None

Recommendation
None

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

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

V | Globale Optimierung I
2550134, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Learning Content

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

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

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

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

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

Literature

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

| 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
Written examination | Credits
9 | Recurrence
Each summer term | Version
1 |

Events					
SS 2019	2550134	Globale Optimierung I	2 SWS	Lecture (V)	Stein
SS 2019	2550136	Globale Optimierung II	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900063_SS2019_HK	Global Optimization I and II		Prüfung (PR)	Stein

Competence Certificate

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

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

Prerequisites
None

Recommendation
None

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

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

| V | **Globale Optimierung I**
2550134, SS 2019, 2 SWS, Open in study portal | Lecture (V) |

Learning Content

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

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

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

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

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

Literature

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

| V | **Globale Optimierung II**
2550136, SS 2019, 2 SWS, Open in study portal | **Lecture (V)** |

Learning Content

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

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

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

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

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

Literature

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

T   6.87 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

Events					
SS 2019	2550135	Übungen zu Globale Optimierung I+II	1 SWS	Practice (Ü)	Stein
SS 2019	2550136	Globale Optimierung II	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900062_SS2019_HK	Global Optimization II		Prüfung (PR)	Stein

Competence Certificate

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

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

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

Prerequisites

None

Annotation

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

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

V   Globale Optimierung II
2550136, SS 2019, 2 SWS, Open in study portal   Lecture (V)

Learning Content

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

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

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

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

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

Literature

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

T 6.88 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	Human Resource Management	2 SWS	Lecture (V)	Nieken
WS 19/20	2573006	Übung zu Human Resource Management	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
SS 2019	7900134	Human Resource Management		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	**Human Resource Management**	**Lecture (V)**
	2573005, WS 19/20, 2 SWS, Language: German, Open in study portal	

Notes

See Module Handbook

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-101646 - Introduction to Natural Hazards and Risk Analysis 1
                      M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
                      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	Wasserbau und Wasserwirtschaft	2 SWS	Lecture (V)	Nestmann
WS 19/20	6200512	Übungen zu Wasserbau und Wasserwirtschaft	1 SWS	Practice (Ü)	Seidel
Exams					
SS 2019	8230101667	Hydraulic Engineering and Water Management		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-101646 - Introduction to Natural Hazards and Risk Analysis 1
	M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
	M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type Written examination	**Credits** 4	**Recurrence** Each winter term	**Version** 2

Events					
WS 19/20	6200513	Hydrologie	2 SWS	Lecture (V)	Zehe, Wienhöfer
WS 19/20	6200514	Übungen zu Hydrologie	1 SWS	Practice (Ü)	Zehe, Wienhöfer
Exams					
SS 2019	8230101693	Hydrology		Prüfung (PR)	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					
SS 2019	2123900	I4.0 Systems platform	4 SWS		Ovtcharova, Maier
WS 19/20	2123900	I4.0 Systems platform	4 SWS		Ovtcharova, Maier

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, SS 2019, 4 SWS, Language: German, Open in study portal

Notes
Number of participants limited to 15 people. There is a participant selection process.

Learning 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.

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 2019	2560238	Industrial Organization	2 SWS	Lecture (V)	Reiß, Hofmann
SS 2019	2560239	Übung zu Industrieökonomie	2 SWS	Practice (Ü)	Reiß, Hofmann
Exams					
SS 2019	79192IO	Industrial Organization		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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Learning Content
This course introduces the theory of industrial organization using game theoretical models. The course is divided into two parts: The first part reviews standard market forms (monopoly, oligopoly, perfect competition). The second part discusses more advanced topics including price discrimination, strategic product differentiation, cartel formation, market entry, and research and development.

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

Literature
Compulsory Textbook:

H. Bester (2012): Theorie der Industrieökonomik, Springer-Verlag.

Additional Literature:

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 Examination of another type	Credits 3	Recurrence Each term	Version 2

Events					
SS 2019	2122014	Information Engineering	2 SWS	Seminar (S)	Ovtcharova, Mitarbeiter
Exams					
SS 2019	76-T-MACH-102209	Information Engineering		Prüfung (PR)	Ovtcharova

Competence Certificate
Alternative exam assessment (written composition and speech)

Prerequisites
None

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 Oral examination	**Credits** 4	**Recurrence** Each summer term	**Version** 2

Events					
SS 2019	2121001	Integrated Information Systems for engineers	3 SWS	Lecture / Practice (VÜ)	Ovtcharova, Mitarbeiter
Exams					
SS 2019	76-T-MACH-102083	Integrated Information Systems for Engineers		Prüfung (PR)	Ovtcharova, Elstermann

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 2019, 3 SWS, Language: German, Open in study portal	**Lecture / Practice (VÜ)**

Learning Content

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

Workload
Regular attendance: 31,5 hours, self-study: 108 hours

Literature
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 Written examination	Credits 9	Recurrence Each summer term	Version 1

Events					
SS 2019	2150660	Integrated Production Planning in the Age of Industry 4.0	6 SWS	Lecture / Practice (VÜ)	Lanza
Exams					
SS 2019	76-T-MACH-109054	Integrated Production Planning in the Age of Industry 4.0		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 2019, 6 SWS, Language: German, Open in study portal | Lecture / Practice (VÜ) |

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes

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

Learning 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.

Workload
MACH:
regular attendance: 63 hours
self-study: 177 hours
WING:
regular attendance: 63 hours
self-study: 207 hours

Literature
Lecture Notes

T 6.96 Course: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]

Responsible: 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 2019	2150601	Integrative Strategies in Production and Development of High Performance Cars	2 SWS	Lecture (V)	Schlichtenmayer
Exams					
SS 2019	76-T-MACH-105188	Integrative Strategies in Production and Development of High Performance Cars	Prüfung (PR)	Lanza	

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
Lecture (V)
2150601, SS 2019, 2 SWS, Language: German, Open in study portal

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/).

Notes

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

Learning 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

Workload

regular attendance: 21 hours
self-study: 99 hours

Literature

Lecture Slides

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 2019	2530570	International Finance	2 SWS	Lecture (V)	Walter, Uhrig-Homburg
Exams					
SS 2019	7900097	International Finance		Prüfung (PR)	Uhrig-Homburg

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

Annotation
See German version.

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

V International Finance
2530570, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
The main aspects of this course are the chances and the risks which are associated with international transactions. We carry outour analysis fromtwo distinctperspectives:First the point of view of an international investor second that, of an international corporation.Several alternativesto the management of foreignexchangerisks are shown. Due to the importance of foreign exchangerisks, the first part of the course deals withcurrency markets. Furthermore current exchange rate theories are discussed.

Learning Content
The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

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

Literature
Elective literature:

- Eiteman, D. et al., Multinational Business Finance, 13. edition, 2012.
- Solnik, B. and D. McLeavey, Global Investments, 6. edition, 2008.

T	**6.98 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 Written examination	**Credits** 1,5	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2572155	International Marketing	1 SWS	Lecture (V)	Feurer
Exams					
SS 2019	7900148	International Marketing		Prüfung (PR)	Klarmann
WS 19/20	7900123	International Marketing		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).

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)**

Learning 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.

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

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

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

T 6.99 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 Written examination	Credits 3	Recurrence Each winter term	Version 2

Events					
WS 19/20	24354	Internet Law	2 SWS	Lecture (V)	Dreier
Exams					
SS 2019	7500057	Internet Law		Prüfung (PR)	Dreier, Matz
WS 19/20	7500060	Internet Law		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

T 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	2

Events					
SS 2019	2581010	Introduction to Energy Economics	2 SWS	Lecture (V)	Fichtner, Sandmeier, Lehmann
SS 2019	2581011	Übungen zu Einführung in die Energiewirtschaft	2 SWS	Practice (Ü)	Lehmann, Kleinebrahm, Jochem, Sandmeier
Exams					
SS 2019	7981010	Introduction to Energy Economics		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:

V Introduction to Energy Economics
2581010, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Learning 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)

Workload
The total workload for this course is approximately 165.0 hours. For further information see German version.

Literature
Complementary literature:

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-101646 - Introduction to Natural Hazards and Risk Analysis 1
         M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
         M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type Written examination	**Credits** 5	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	6339057	Einführung in die Ingenieurgeologie	4 SWS	Lecture / Practice (VÜ)	Blum
Exams					
SS 2019	8210_0100016	Introduction to Engineering Geology		Prüfung (PR)	Blum

Prerequisites

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 2019	2520525	Introduction to Game Theory	2 SWS	Lecture (V)	Reiß
SS 2019	2520526	Übungen zu Einführung in die Spieltheorie	1 SWS	Practice (Ü)	Reiß
Exams					
SS 2019	79192GT	Introduction to Game Theory		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 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Learning 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.

Workload

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

Literature
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.

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-101646 - Introduction to Natural Hazards and Risk Analysis 1
	M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
	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					
SS 2019	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences		Prüfung (PR)	Wursthorn, Rösch

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-101646 - Introduction to Natural Hazards and Risk Analysis 1
	M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
	M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Recurrence	Version
Completed coursework	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

T | 6.106 Course: Introduction to Microsystem Technology I [T-MACH-105182]

Responsible:	Dr. Vlad Badilita 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 winter term	1

Events					
WS 19/20	2141861	Introduction to Microsystem Technology I	2 SWS	Lecture (V)	Korvink, Badilita

Exams				
SS 2019	76-T-MACH-105182	Introduction to Microsystem Technology I	Prüfung (PR)	Korvink, Badilita

Competence Certificate
written examination for implementation in a major field, 30 min oral exam for elective subject

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)

Learning Content
- Introduction in Nano- and Microtechnologies
- Silicon and processes for fabricating microelectronics circuits
- Basic physics background and crystal structure
- Materials for micromachining
- Processing technologies for microfabrication
- Silicon micromachining
- Examples

Workload
Literature: 20 h

Lessions: 21 h

Preparation and Review: 50 h

Exam preparation: 30 h

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

Events					
SS 2019	2142874	Introduction to Microsystem Technology II	2 SWS	Lecture (V)	Korvink, Badilita
Exams					
SS 2019	76-T-MACH-105183	Introduction to Microsystem Technology II	Prüfung (PR)		Korvink, Badilita

Competence Certificate
written examination for major field, oral exam (30 min) for elective field

Prerequisites
none

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

V   Introduction to Microsystem Technology II   Lecture (V)
2142874, SS 2019, 2 SWS, Language: English, Open in study portal

Learning Content
- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

Workload
Literature: 20 h

Lessions: 21 h

Preparation and Review: 50 h

Exam preparation: 30 h

Literature
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 Written examination	**Credits** 9	**Recurrence** see Annotations	**Version** 1

Events					
SS 2019	2550040	Introduction to Operations Research I	2+2 SWS	Lecture (V)	Stein
WS 19/20	2530043	Introduction to Operations Research II	2 SWS	Lecture (V)	Stein
WS 19/20	2530044		2 SWS	Tutorial (Tu)	Assistenten, Stein
Exams					
SS 2019	7900135	Introduction to Operations Research I and II		Prüfung (PR)	Nickel

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 I
2550040, SS 2019, 2+2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description
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 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, multicriteria optimization.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal flows in networks.

Workload

Berechnung des Arbeitsaufwands eines durchschnittlichen Studenten um die Lernziele zu erreichen. (Intern)

Eine Vernetzung von learningoutcomes (Wissen (content), Kompetenzen (skills) und levels mit dem dafür geschätzten Arbeitsaufwand eines durchschnittlichen Studenten ist anzustreben.

Literature

- Nickel, Stein, Waldmann: Operations Research, 2nd edition, 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 Written examination	**Credits** 5	**Recurrence** Each winter term	**Version** 2

Events					
WS 19/20	2511000	Introduction to Programming with Java	3 SWS	Lecture (V)	Zöllner
WS 19/20	2511002	Tutorien zu Programmieren I: Java	1 SWS	Tutorial (Tu)	Zöllner, Struppek, Ulrich
WS 19/20	2511003	Computer lab Introduction to Programming with Java	2 SWS		Zöllner, Struppek, Ulrich
Exams					
SS 2019	7900042	Introduction to Programming with Java		Prüfung (PR)	Zöllner
WS 19/20	7900018	Introduction to Programming with Java		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 prerequisited 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)

Notes
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.

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

Events					
WS 19/20	2560131	Introduction to Public Finance	3 SWS	Lecture (V)	Wigger
Exams					
SS 2019	790fiwi	Introduction to Public Finance		Prüfung (PR)	Wigger
WS 19/20	790fiwi	Introduction to Public Finance		Prüfung (PR)	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)

Learning 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.

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

Literature
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** Written examination | **Credits** 4,5 | **Recurrence** Each summer term | **Version** 1 |

Events					
SS 2019	2550470	Einführung in die Stochastische Optimierung	2 SWS	Lecture (V)	Rebennack
SS 2019	2550471	Übung zur Einführung in die Stochastische Optimierung	1 SWS	Practice (Ü)	Rebennack, Assistenten
Exams					
SS 2019	7900198	Introduction to Stochastic Optimization		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 Written examination	Credits 4,5	Recurrence Each summer term	Version 1

Events					
SS 2019	2530575	Investments	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530576	Übung zu Investments	1 SWS	Practice (Ü)	Uhrig-Homburg, Grauer
Exams					
SS 2019	7900109	Investments		Prüfung (PR)	Uhrig-Homburg

Competence Certificate

The assessment consits 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 eyery 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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description

The lecture deals with investment decisions under uncertainty, where the main emphasis is on investment decisions on stock markets. After a discussion of the basic questions of corporate valuation, the lecture focuses on portfolio theory. After that, risk and return in equilibrium are derived using the Capital Asset Pricing Model and the Arbitrage Pricing Theory, followed by an introduction into derivatives markets, especially forwards and futures. The lecture concludes with investments on bond markets.

Learning Content

The lecture deals with investment decisions under uncertainty, where the main emphasis is on investment decisions on stock markets. After a discussion of the basic questions of corporate valuation, the lecture focuses on portfolio theory. After that, risk and return in equilibrium are derived using the Capital Asset Pricing Model and the Arbitrage Pricing Theory. The lecture concludes with investments on bond markets.

Workload

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

Literature
Elective literature:

Bodie/Kane/Marcus (2010): Essentials of Investments, Eighth Edition, 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 2019	2150550	Laboratory Production Metrology	3 SWS	Practical course (P)	Häfner
Exams					
SS 2019	76-T-MACH-108878	Laboratory Production Metrology		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 al 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 2019, 3 SWS, Language: German, Open in study portal

Practical course (P)

Description
Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/). Additional reference to literature will be provided, as well.

Notes

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 student 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
- Coodinate 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 asses 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

Learning 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 student 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
- Coodinate measurement technology
- Industrial computed tomography
- Measurement uncertainty evaluation
- Analysis of production data by means of data mining

Workload

regular attendance: 31,5 hours
self-study: 88,5 hours

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 Examination of another type	Credits 7	Version 1

Exams				
SS 2019	7100014	Laboratory Work in General and Inorganic Chemistry	Prüfung (PR)	Anson

Prerequisites

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 2019	24671	Law of Contracts	2 SWS	Lecture (V)	Hoff
Exams					
SS 2019	7500055	Law of Contracts		Prüfung (PR)	Dreier, Matz
WS 19/20	7500059	Law of Contracts		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	Learning Factory "Global Production"	2 SWS		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

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

Description
Media:

E-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (https://ilias.studium.kit.edu/).

Notes

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 attendence: ~ 36 h
self-study: ~ 60 h

Learning 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

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

Workload

e-Learning: ~ 24 h
regular attendence: ~ 36 h
self-study: ~ 60 h

| T | **6.117 Course: Logistics - Organisation, Design and Control of Logistic Systems [T-MACH-102089]** |

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

Part of: M-WIWI-101421 - Supply Chain Management

| **Type**
Written examination | **Credits**
6 | **Recurrence**
Each summer term | **Version**
1 |

Events					
SS 2019	2118078	Logistics - Organisation, Design, and Control of Logistic Systems	3 SWS	Lecture (V)	Furmans
Exams					
SS 2019	76-T-MACH-102089	Logistics - Organisation, Design and Control of Logistic Systems		Prüfung (PR)	Furmans, Mittwollen

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

Prerequisites
None

Recommendation
Requied are lectures on "Linear Algebra" and "Stochastic".

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

| V | **Logistics - Organisation, Design, and Control of Logistic Systems**
2118078, SS 2019, 3 SWS, Language: German, Open in study portal | **Lecture (V)** |

Description
Media:

Blackboard, LCD projector, in excercises also PCs.

Learning Content

Introduction

- historical overview
- lines of development

Structure of logistics systems

Distribution logistics

- location planning
- Vehicle Routing Planning
- distribution centers

Inventory management

- demand forecasting
- Inventory management policies
- Bullwhip effect

Production logistics

- layout planning
- material handling
- flow control

Supply Managament

- information flow
- transportation organization
- controlling and development of a logistics system
- co-operation mechanisms
- Lean SCM
- SCOR model

Identification Technologies

Workload

180 hrs

Literature

- Arnold/Isermann/Kuhn/Tempelmeier. Handbuch Logistik, Springer Verlag, 2002 (Neuauflage in Arbeit)
- Domschke. Logistik, Rundreisen und Touren, Oldenbourg Verlag, 1982
- Domschke/Drexl. Logistik, Standorte, Oldenbourg Verlag, 1996
- Gudehus. Logistik, Springer Verlag, 2007
- Neumann-Morlock. Operations-Research, Hanser-Verlag, 1993
- Tempelmeier. Bestandsmanagement in Supply Chains, Books on Demand 2006
- Schönsleben. Integrales Logistikmanagement, Springer, 1998

T   6.118 Course: Logistics and Supply Chain Management [T-WIWI-102870]

Responsible:	Dr. Marcus Wiens
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101437 - Industrial Production I

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

Events					
SS 2019	2581996	Logistics and Supply Chain Management	2 SWS	Lecture (V)	Wiens
SS 2019	2581997	Übung zu Logistics and Supply Chain Management	1 SWS	Practice (Ü)	Diehlmann, Lüttenberg
Exams					
SS 2019	7981996	Logistics and Supply Chain Management		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   Lecture (V)
2581996, SS 2019, 2 SWS, Language: English, Open in study portal

Learning Content

- Introduction: Basic Terms and Concepts
- Logistics Systems and Supply Chain Management
- Supply Chain Risk Management
- Extensions and Applications

Workload

Toatl effort required will account for approximately 105h (3.5 credits).

Literature

will be announced in the course

| 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	Machine Tools and Industrial Handling	6 SWS	Lecture / Practice (VÜ)	Fleischer
Exams					
SS 2019	76-T-MACH-102158-MIT	Machine Tools and Industrial Handling		Prüfung (PR)	Fleischer
SS 2019	76-T-MACH-102158-WING	Machine Tools and Industrial Handling		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)** |

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes

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

Learning 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

Annotation

None

Workload
MACH:
regular attendance: 63 hours
self-study: 177 hours
WiIng:/TVWL
regular attendance: 63 hours
self-study: 207 hours

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

Events					
WS 19/20	2560404	Macroeconomic Theory	2 SWS	Lecture (V)	Scheffel
WS 19/20	2560405	Übung zu Macroeconomic Theory	1 SWS	Practice (Ü)	Pegorari
Exams					
SS 2019	7900232	Macroeconomic Theory		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)

Description

This course introduces a modern approach to macroeconomics by building on microeconomic principles. To be able to rigorously address key macroeconomic questions a general framework based on intertemporal decision making is introduced. Starting by the principles of consumer and firm behavior, this framework is successively expanded by introducing market imperfections, monetary factors as well as international trade. With this framework at hand students are able to analyze labor market policies, government deficits, monetary policy, financial crises, trade policy, and other important macroeconomic problems. Throughout the course, we not only point out the power of theory but also its limitations.

Workload

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

Literature

Literature and lecture notes are provided during the course.

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 2019	2579900	Management Accounting 1	2 SWS	Lecture (V)	Wouters
SS 2019	2579901	Übung zu Management Accounting 1	2 SWS	Practice (Ü)	Riar
Exams					
SS 2019	79-2579900-00	Management Accounting 1		Prüfung (PR)	Wouters
WS 19/20	79-2579900-00	Management Accounting 1		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 tuturial and examination.

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

V | Management Accounting 1
2579900, SS 2019, 2 SWS, Language: English, Open in study portal   **Lecture (V)**

Notes

see Module Handbook

Learning Content

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Workload

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

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

| V | **Übung zu Management Accounting 1**
2579901, SS 2019, 2 SWS, Language: English, Open in study portal | **Practice (Ü)** |

Notes
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	Management Accounting 2	2 SWS	Lecture (V)	Wouters
WS 19/20	2579904		2 SWS	Practice (Ü)	Ebinger
WS 19/20	2579905		2 SWS	Practice (Ü)	Ebinger
Exams					
SS 2019	79-2579902-00	Management Accounting 2		Prüfung (PR)	Wouters
WS 19/20	79-2579903-00	Management Accounting 2		Prüfung (PR)	Wouters

Competence Certificate
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester.

Prerequisites
None

Recommendation
It is recommended to take part in the course "Management Accounting 1" before this course.

Annotation
Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tuturial and examination.

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

V Management Accounting 2
2579903, WS 19/20, 2 SWS, Language: English, Open in study portal

Lecture (V)

Notes
see Module Handbook

Learning Content
The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems and customer value propositions.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

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

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

V	2579904, WS 19/20, 2 SWS, Language: English, Open in study portal	**Practice (Ü)**

Notes
see Module Handbook

V	2579905, WS 19/20, 2 SWS, Language: English, Open in study portal	**Practice (Ü)**

Notes
see Module Handbook

T   6.123 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 2019	2577900	Management and Strategy	2 SWS	Lecture (V)	Lindstädt
Exams					
SS 2019	7900067	Management and Strategy		Prüfung (PR)	Lindstädt

Competence Certificate
The assessment consists of a written exam (60 min) taking place at the beginn of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

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

V   Management and Strategy
2577900, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description

- 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 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.

Annotation
The credits for the course "Management and Strategy" have been changed from 4 to 3,5 from summer term 2015 on.

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

Literature

- Grant, R.M.: *Contemporary Strategy Analysis.* Blackwell, 5. Aufl. Massachusetts 2005.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche von Unternehmen.* Gabler, Wiesbaden 2004.

The relevant excerpts and additional sources are made known during the course.

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	Managing Organizations	2 SWS	Lecture (V)	Lindstädt
Exams					
SS 2019	7900066	Managing Organizations		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)**

Description

- 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 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.

Annotation

The credits for the course "Managing Organizations" have been changed from 4 to 3,5 from summer term 2015 on.

Workload

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

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.

The relevant excerpts and additional sources are made known during the course.

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 2019	2571152	Managing the Marketing Mix	2 SWS	Lecture (V)	Klarmann
SS 2019	2571153	Übung zu Marketing Mix (Bachelor)	1 SWS	Practice (Ü)	Moosbrugger, Pade
Exams					
SS 2019	7900023	Managing the Marketing Mix		Prüfung (PR)	Klarmann
SS 2019	7900205	Managing the Marketing Mix		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).

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

V   Managing the Marketing Mix   Lecture (V)
2571152, SS 2019, 2 SWS, Language: German, Open in study portal

Learning Content
The content of this course concentrates on the elements of the marketing mix. Therefore the main chapters are:

- Brand management
- Pricing
- Promotion

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

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

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	Manufacturing Technology	6 SWS	Lecture / Practice (VÜ)	Schulze, Zanger
Exams					
SS 2019	76-T-MACH-102105	Manufacturing Technology		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**	**Lecture / Practice (VÜ)**
	2149657, WS 19/20, 6 SWS, Language: German, Open in study portal	

Description
Media:

Lecture notes will be provided in ilias (https://ilias.studium.kit.edu/).

Notes

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 lucture 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

Learning 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 lucture provides an excursion to an industry company.

Annotation
None

Workload
regular attendance: 63 hours
self-study: 177 hours

Literature
Lecture Notes

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-101269 - Introduction to Technical Logistics
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	Material flow in logistic systems	6 SWS	Others (sonst.)	Furmans
Exams					
SS 2019	76-T-MACH-102151	Material Flow in Logistic Systems		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.)

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).

Media: Presentations, black board, book, video recordings

Notes
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.

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

Annotation

Workload

Regular attendance: 35 h

Self-study: 135 h

Group work: 100 h

Literature
Arnold, Dieter; Furmans, Kai : Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 2009

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

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	Mathematik 1 für die Fachrichtung Wirtschaftswissenschaften	4 SWS	Lecture (V)	Folkers
WS 19/20	0135100	Übungen zu 0135000	2 SWS	Practice (Ü)	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 Written examination	**Credits** 3,5	**Version** 1

Exams				
SS 2019	6700021	Mathematics II - Final Exam	Prüfung (PR)	Winter, Last, Folkers
SS 2019	6700040	Mathematics II - Final Exam	Prüfung (PR)	Last, Winter, Folkers

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 2019	0183000	Mathematik 2 für die Fachrichtung Wirtschaftswissenschaft	4 SWS	Lecture (V)	Folkers
SS 2019	0183100	Übungen zu 0183000	2 SWS	Practice (Ü)	Folkers
Exams					
SS 2019	6700008	Mathematics II - Midterm Exam		Prüfung (PR)	Winter, Last, Folkers
SS 2019	6700039	Mathematics II - Midterm Exam		Prüfung (PR)	Folkers, Last, Winter

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 Written examination	**Credits** 7	**Version** 1

Events					
WS 19/20	0135200	Mathematik 3 für die Fachrichtung Wirtschaftswissenschaften	4 SWS	Lecture (V)	Winter
WS 19/20	0135300	Übungen zu 0135200	2 SWS	Practice (Ü)	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					
SS 2019	2146131	Mechanical Design Basics II	2 SWS	Lecture (V)	Albers, Matthiesen
WS 19/20	2145131	Mechanical Design Basics I	2 SWS	Lecture (V)	Albers, Matthiesen, Behrendt

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 II   Lecture (V)
2146131, SS 2019, 2 SWS, Language: German, Open in study portal

Description
Media:

Beamer

Visualizer

Mechanical components

Notes
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

Learning Content

Sealings

Design

Dimensioning

Component connections

Bolt connection

Tutorials take place in concomitant to the lectures.

Annotation
Lecture notes:

The Productdevelopment knowledge base PKB will be provided in digital form for registered students. All lecture notes and additional slides will be provided in Ilias.

Workload
regular attendance: 42 h

self-study: 80 h

Literature
Konstruktionselemente des Maschinenbaus - 1 und 2
Grundlagen der Berechnung und Gestaltung von Maschinenelementen;
Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X ,

also available as electronic paper at the KIT catalogue.

Grundlagen von Maschinenelementen für Antriebsaufgaben;
Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8)

V	**Mechanical Design Basics I** 2145131, WS 19/20, 2 SWS, Language: German, Open in study portal	**Lecture (V)**

Description
Media:

Beamer

Visualizer

Mechanical components

Learning Content
Introduction in product engineering

Tools of visualization (technical drawing)

Product manufacturing as problem solving

Product manufacturing of technical systems:

- system theory
- Contact and Channel C&C²-A

Basics of chosen design- and machining elements

- springs
- bearings
- sealings

Concommitant to the lectures tutorials take place with the following contents:

Gear workshop

Tutorial "tools of visualization (technical drawing)"

Tutorial "technical systems product development, sytem theory, Contact and Chanel C&C²-A"

Tutorial "springs"

Tutorial "bearing and bearing arrangements"

Annotation
Lecture notes:

The Productdevelopment knowledge base PKB will be provided in digital form for registered students. All lecture notes and additional slides will be provided in Ilias.

Workload
regular attendance: 42 h

self-study: 80 h

Literature
Lecture notes:

The lecture notes can be downloaded via the eLearning platform Ilias.

Literature:

Konstruktionselemente des Maschinenbaus - 1 und 2
Grundlagen der Berechnung und Gestaltung von
Maschinenelementen;
Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

or per full text access provided by university library

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	Tutorials Mechanical Design Basics I	1 SWS	Practice (Ü)	Albers, Matthiesen, Behrendt, Mitarbeiter

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)

Description
Media:

Beamer

Visualizer

Gear box (Workshop)

Learning Content
Gear workshop

Tutorial "tools of visualization (technical drawing)"

Tutorial "technical systems product development, sytem theory, element model C&CM"

Tutorial "springs"

Tutorial "bearing and bearing arrangements"

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 2019	2146132	Tutorials Mechanical Design Basics II	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 2019, 2 SWS, Language: German, Open in study portal

Practice (Ü)

Description
Media:

Beamer

Visualizer

Notes

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

Learning Content

Bearings

Sealings

Design

Tolerances and fittings

Shaft-hub connections

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.-Ing. 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 2019	2150681	Metal Forming	2 SWS	Lecture (V)	Herlan
Exams					
SS 2019	76-T-MACH-105177	Metal Forming		Prüfung (PR)	Schulze

Competence Certificate
Oral Exam (20 min)

Prerequisites
none

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

V Metal Forming
2150681, SS 2019, 2 SWS, Language: German, Open in study portal
Lecture (V)

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes
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

Learning 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

Annotation
None

Workload
regular attendance: 21 hours
self-study: 99 hours

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 2019	2142881	Microactuators	2 SWS	Lecture (V)	Kohl
Exams					
SS 2019	76-T-MACH-101910	Microactuators		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 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
Media:

Script of ppt-slides

Learning 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

Annotation
Details will be announced at the beginning of the lecture

Workload
lecture time 1.5 h/week

self preparation: 8.5 h/week

Literature

- Lecture notes

- 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, Cambride 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 2019	6200404	Spatial Planning and Planning Law	2 SWS	Lecture (V)	Wilske
SS 2019	6200405	Exercises to Spatial Planning and Planning Law	1 SWS	Practice (Ü)	Wilske, Mitarbeiter/innen
SS 2019	6200406	Transportation Systems	2 SWS	Lecture (V)	Vortisch
SS 2019	6200407	Exercises to Transportation Systems	SWS	Practice (Ü)	Vortisch, Mitarbeiter/innen
SS 2019	6200408	Design Basics in Highway Engineering	2 SWS	Lecture (V)	Roos, Zimmermann
SS 2019	6200409	Exercises to Design Basics in Highway Engineering	SWS	Practice (Ü)	Plachkova-Dzhurova, Zimmermann
Exams					
SS 2019	8234101791	Mobility and Infrastructure		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 excercises.

Annotation

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

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

Events					
SS 2019	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course (P)	Nickel, Bakker
Exams					
SS 2019	7900234	Modeling and OR-Software: Introduction		Prüfung (PR)	Nickel

Competence Certificate
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the software laboratory and the following term.

Prerequisites
None

Recommendation
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 2019, 3 SWS, Language: German, Open in study portal	Practical course (P)

Learning Content
The task of solving combinatorial and nonlinear optimization problems imposes much higher requirements on suggested solution approaches as in linear programming.

During the course of this software laboratory, students get to know important methods from combinatorial optimization, e.g. Branch & Cut- or Column Generation methods and are enabled to solve problems with the software system IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL. In addition, issues of nonlinear optimization, e.g. quadratic optimization, are addressed. As an important part of the software laboratory, students get the possibility to model combinatorial and nonlinear problems and implement solution approaches in the software system.

The software laboratory also introduces some of the most frequently used modelling and programming languages that are used in practice to solve optimization problems.

Annotation
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The lecture is held irregularly. The planned lectures and courses for the next three years are announced online.

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

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 that 70% of the lectures
Duration: 1 h

aids: none

Prerequisites

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

Events					
WS 19/20	2550111	Nonlinear Optimization I	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	Exercises Nonlinear Optimization I + II	SWS	Practice (Ü)	Stein
Exams					
SS 2019	7900064_SS2019_NK	Nonlinear Optimization I		Prüfung (PR)	Stein

Competence Certificate

The assessment consits of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of *Nonlinear Optimization II* [2550113]. In this case, the duration of the written examination takes 120 minutes.

Prerequisites

The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

Annotation

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

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

V Nonlinear Optimization I
2550111, WS 19/20, 2 SWS, Open in study portal   **Lecture (V)**

Learning Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.

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

Annotation

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

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T 6.143 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	Nonlinear Optimization I	2 SWS	Lecture (V)	Stein
WS 19/20	2550112	Exercises Nonlinear Optimization I + II	SWS	Practice (Ü)	Stein
WS 19/20	2550113	Nonlinear Optimization II	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900066_SS2019_NK	Nonlinear Optimization I and II		Prüfung (PR)	Stein

Competence Certificate

The assessment consits of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

Prerequisites

None.

Annotation

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

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

V Nonlinear Optimization I
2550111, WS 19/20, 2 SWS, Open in study portal   **Lecture (V)**

Learning Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality condtions for unconstrained problems
- Optimality conditions for unconstrained convex problems
- Numerical methods for unconstrained problems (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

Constrained problems are the contents of part II of the lecture.

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

Annotation

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

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

V	**Nonlinear Optimization II** 2550113, WS 19/20, 2 SWS, Open in study portal	**Lecture (V)**

Learning Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

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

Annotation

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

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T 6.144 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	Exercises Nonlinear Optimization I + II	SWS	Practice (Ü)	Stein
WS 19/20	2550113	Nonlinear Optimization II	2 SWS	Lecture (V)	Stein
Exams					
SS 2019	7900065_SS2019_NK	Nonlinear Optimization II		Prüfung (PR)	Stein

Competence Certificate

The assessment consits 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 OptimizationI* [2550111]. In this case, the duration of the written exam takes 120 minutes.

Prerequisites

None.

Annotation

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

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

V Nonlinear Optimization II
2550113, WS 19/20, 2 SWS, Open in study portal

Lecture (V)

Learning Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions for constrained problems
- Optimality conditions for constrained convex problems
- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

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

Annotation

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

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T	**6.145 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 Written examination	**Credits** 4	**Recurrence** Each winter term	**Version** 3

Events					
WS 19/20	2141865	Novel actuators and sensors	2 SWS	Lecture (V)	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)**

Description
Media:

Script / script of ppt foils (part 2)

Learning Content
Contents: - Basic knowledge in the material science of actuator and sensor principles

- Layout and design optimization

- Fabrication technologies

- Selected developments

- Applications

Index: The lecture includes amongst others the following topics:

- Piezo actuators
- Magnetostrictive actuators
- Shape memory actuators
- Electro-/magnetorheological actuators
- Sensors: Concepts, materials, fabrication
- Micromechanical sensors: Pressure, force, inertia sensors
- Temperature sensors
- Micro sensors for bio analytics
- Mechano-magnetic sensors

The lecture addresses students in the fields of mechanical engineering, mechatronics and information technology, materials science and engineering, electrical engineering and economic sciences. A comprehensive introduction is given in the basics and current developments on the macroscopic length scale.

The lecture is core subject of the major course "Actuators and Sensors" of the specialization "Mechatronics and Microsystems Technology" in Mechanical Engineering.

Workload
Work Lecture:

time of attendance: 21 hours

Self-study: 99 hours

Literature
- Lecture notes

- 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: Operative CRM [T-WIWI-102597]

Responsible:	Prof. Dr. Andreas Geyer-Schulz
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101422 - Specialization in Customer Relationship Management
	M-WIWI-101460 - CRM and Service Management

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

Events					
WS 19/20	2540522	Operative CRM	2 SWS	Lecture (V)	Geyer-Schulz
WS 19/20	2540523	Übung Operatives CRM	1 SWS	Practice (Ü)	Schweigert
Exams					
SS 2019	7900281	Operative CRM		Prüfung (PR)	Geyer-Schulz

Competence Certificate

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

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

Prerequisites

None

Recommendation

The attendance of courses Customer Relationship Management and Analytical CRM is advised.

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

V Operative CRM

2540522, WS 19/20, 2 SWS, Language: German, Open in study portal

Lecture (V)

Learning Content

The Student should be able to understand and implement methods and applications within the operative CRM. This includes, but is not limited to the analysis of business processes, as a basis for improvements in CRM, and applications like call centers.

Workload

The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

Sum: 135h 00m

Literature

Jill Dyché. The CRM Handbook: A Business Guide to Customer Relationship Management. Addison-Wesley, Boston, 2 edition, 2002.

Ronald S. Swift. Accelerating Customer Relationships: Using CRM and RelationshipTechnologies. Prentice Hall, Upper Saddle River, 2001.

Elective literature:

Alex Berson, Kurt Thearling, and Stephen J. Smith. Building Data Mining Applications for CRM. Mc Graw-Hill, New York, 2000.

Stanley A. Brown. Customer Relationship Management: A Strategic Imperative in theWorld of E-Business. John Wiley, Toronto, 2000.

Dimitris N. Chorafas. Integrating ERP, CRM, Supply Chain Management, and SmartMaterials. Auerbach Publications, Boca Raton, Florida, 2001.

Keith Dawson. Call Center Handbook: The Complete Guide to Starting, Running, and Improving Your Call Center. CMP Books, Gilroy, CA, 4 edition, 2001.

Andreas Eggert and Georg Fassot. eCRM – Electronic Customer Relationship Management: Anbieter von CRM-Software im Vergleich. Schäffer-Poeschel, Stuttgart, 2001.

Seth Godin. Permission Marketing. Kunden wollen wählen können. FinanzBuch Verlag, München, 1999.

Paul Greenberg. CRM at the Speed of Light: Capturing and Keeping Customers in Internet Real Time. Osborne/McGraw-Hill, 3rd ed. edition, Aug 2004.

Philip Kotler. Marketing Management: Millennium Edition. Prentice Hall, Upper Saddle River, 10 edition, 2000.

Don Peppers and Martha Rogers. The One To One Future. Currency Doubleday, New York, 1997.

Duane E. Sharp. Customer Relationship Management Systems Handbook. Auerbach, 2002.

Len Silverston. The Data Model Resource Book: A Library of Universal Data Models for All Entreprises, volume 1. John Wiley & Sons, 2001.

Toby J. Teorey. Database Modeling and Design. Morgan Kaufmann, San Francisco, 3 edition, 1999.

Chris Todman. Designing a Data Warehouse : Supporting Customer Relationship Management. Prentice Hall, Upper Saddle River, 1 edition, 2001.

T 6.147 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 Written examination	**Credits** 4,5	**Recurrence** Each winter term	**Version** 2

Events					
WS 19/20	2550464	Optimierungsansätze unter Unsicherheit	SWS	Lecture (V)	Rebennack
WS 19/20	2550465	Übungen zu Optimierungsansätze unter Unsicherheit	SWS	Practice (Ü)	Rebennack, Füllner
WS 19/20	2550466		2 SWS	Practice (Ü)	Rebennack, Füllner
Exams					
SS 2019	7900202	Optimization under Uncertainty		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   6.148 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 2019	2309486	Optoelectronic Components	2 SWS	Lecture (V)	Freude
SS 2019	2309487	Optoelectronic Components (Tutorial)	1 SWS	Practice (Ü)	Freude
Exams					
SS 2019	7309486	Optoelectronic Components		Prüfung (PR)	Freude
SS 2019	7309486-W	Optoelectronic Components (Wiederholungsprüfung)		Prüfung (PR)	Freude
WS 19/20	7309486	Optoelectronic Components		Prüfung (PR)	Freude

Prerequisites

T   6.149 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 2019	24656	Patent Law	2 SWS	Lecture (V)	Koch
Exams					
SS 2019	7500062	Patent Law		Prüfung (PR)	Dreier, Matz
WS 19/20	7500001	Patent Law		Prüfung (PR)	Dreier, Matz

T   6.150 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 2019	2573001	Personnel Policies and Labor Market Institutions	2 SWS	Lecture (V)	Nieken
SS 2019	2573002	Übungen zu Personalpolitik und Arbeitsmarktinstitutionen	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
SS 2019	7900133	Personnel Policies and Labor Market Institutions		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**	**Lecture (V)**
	2573001, SS 2019, 2 SWS, Language: German, Open in study portal	

Notes

See Module Handbook

T 6.151 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 6.152 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 6.153 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 6.154 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 6.155 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 6.156 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 6.157 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 6.158 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 2019	2142890	Physics for Engineers	2 SWS	Lecture (V)	Weygand, Dienwiebel, Nesterov-Müller, Gumbsch
Exams					
SS 2019	76-T-MACH-100530	Physics for Engineers		Prüfung (PR)	Gumbsch, Weygand, Nesterov-Müller, Dienwiebel

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 2019, 2 SWS, Language: German, Open in study portal	Lecture (V)

Notes
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 (excerises 2142891)
self-study: 97,5 hours and 49 hours (excerises 2142891)

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

Learning 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.

Workload
regular attendance: 22,5 hours (lecture) and 22,5 hours (excerises 2142891)
self-study: 97,5 hours and 49 hours (excerises 2142891)

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 6.159 Course: Platform Economy [T-WIWI-109936]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101421 - Supply Chain Management
M-WIWI-101434 - eBusiness and Service Management
M-WIWI-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	Platform Economy	2 SWS	Lecture (V)	Weinhardt, Dann
WS 19/20	2540469	Übung zu Platform Economy	SWS	Practice (Ü)	Dann, Richter

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)

Learning Content

Apple, Alphabet, Microsoft, Amazon und Facebook; five of the most valuable companies are digital platforms. This lecture provides an overview on how such platforms work, which market mechanisms are effective for achieving certain goals and how users behave on such platforms. The content is exemplified and discussed in several real-world examples and case studies in the field of sharing economy (e.g., airbnb), finance (e.g., social trading) and crowdsourcing (e.g., kickstarter).

T 6.160 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					
SS 2019	2122376	PLM for product development in mechatronics	SWS	Lecture (V)	Eigner
WS 19/20	2122376	PLM for product development in mechatronics	SWS	Lecture (V)	Eigner
Exams					
SS 2019	76-T-MACH-102181	PLM for Product Development in Mechatronics		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, SS 2019, SWS, Language: German, Open in study portal	**Lecture (V)**

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

V	**PLM for product development in mechatronics** 2122376, WS 19/20, SWS, Language: German, Open in study portal	**Lecture (V)**

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

T 6.161 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 Examination of another type	**Credits** 4	**Recurrence** Each term	**Version** 2

Events					
SS 2019	2121357	PLM-CAD Workshop	4 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
WS 19/20	2121357	PLM-CAD Workshop	4 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
Exams					
SS 2019	76-T-MACH-102153	PLM-CAD Workshop		Prüfung (PR)	Ovtcharova

Competence Certificate
Alternative exam assessment (graded)

Prerequisites
None

Annotation
Number of participants is limited, compulsory attendance

| T | **6.162 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 Written examination	**Credits** 6	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2307371	Power Network	2 SWS	Lecture (V)	Leibfried
WS 19/20	2307373	Tutorial for 2307371 Power Network	2 SWS	Practice (Ü)	Hirsching, Leibfried
Exams					
SS 2019	7307371	Power Network		Prüfung (PR)	Leibfried
WS 19/20	7307371	Power Network		Prüfung (PR)	Leibfried

T   6.163 Course: Practical Seminar Digital Services [T-WIWI-105711]

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

Competence Certificate

The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites

None

Recommendation

None

Annotation

The current range of seminar topics is announced on the KSRI website www.ksri.kit.edu.

T   6.164 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	Practical Seminar: Digital Services (Ba)	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   6.165 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 6.166 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 **6.167 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					
SS 2019	2143875	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
SS 2019	2143877	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
WS 19/20	2143875	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
WS 19/20	2143877	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
Exams					
SS 2019	76-T-MACH-102164	Practical Training in Basics of Microsystem Technology	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, SS 2019, 2 SWS, Language: German, Open in study portal   **Practical course (P)**

Learning 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.

Workload
Time of attendance: 21 h + 2 h exam
Privat studies: 5 h preparing experiments + 10 h preparing the exam

V **Introduction to Microsystem Technology - Practical Course**
2143877, SS 2019, 2 SWS, Language: German, Open in study portal   **Practical course (P)**

Learning 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.

Workload
Time of attendance: 21 h + 2 h exam
Privat studies: 5 h preparing experiments + 10 h preparing the exam

V	**Introduction to Microsystem Technology - Practical Course** 2143875, WS 19/20, 2 SWS, Language: German, Open in study portal	**Practical course (P)**

Learning 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.

Workload
Time of attendance: 21 h + 2 h exam
Privat studies: 5 h preparing experiments + 10 h preparing the exam

V	**Introduction to Microsystem Technology - Practical Course** 2143877, WS 19/20, 2 SWS, Language: German, Open in study portal	**Practical course (P)**

Learning 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.

Workload
Time of attendance: 21 h + 2 h exam
Privat studies: 5 h preparing experiments + 10 h preparing the exam

T 6.168 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					
SS 2019	2577910	Problem solving, communication and leadership	1 SWS	Lecture (V)	Lindstädt
WS 19/20	2577910	Problem solving, communication and leadership	1 SWS	Lecture (V)	Lindstädt
Exams					
SS 2019	7900068	Problem Solving, Communication and Leadership		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, SS 2019, 1 SWS, Language: German, Open in study portal   **Lecture (V)**

Learning Content

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the perquisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

Workload

The total workload for this course is approximately 60 hours. For further information see German version.

Literature

The relevant excerpts and additional sources are made known during the course.

V Problem solving, communication and leadership
2577910, WS 19/20, 1 SWS, Language: German, Open in study portal   **Lecture (V)**

Learning Content

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the perquisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

Workload

The total workload for this course is approximately 60 hours. For further information see German version.

Literature

The relevant excerpts and additional sources are made known during the course.

T 6.169 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-101646 - Introduction to Natural Hazards and Risk Analysis 1
                      M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
                      M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Version
Oral examination	3	2

Exams				
SS 2019	8280103542	Procedures of Remote Sensing	Prüfung (PR)	Weidner

T   6.170 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-101646 - Introduction to Natural Hazards and Risk Analysis 1
	M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
	M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type Completed coursework	Credits 1	Recurrence Each summer term	Version 1

Events					
SS 2019	6020244	Fernerkundungsverfahren, Übung	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2019	8284101638	Procedures of Remote Sensing, Prerequisite		Prüfung (PR)	Weidner

Prerequisites
None

Recommendation
None

Annotation
None

T   6.171 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	Product- and Production-Concepts for modern Automobiles	2 SWS	Lecture (V)	Steegmüller, Kienzle

Competence Certificate
Oral Exam (20 min)

Prerequisites
T-MACH-105166 - Materials and Processes for Body Leightweight 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   Lecture (V)
2149670, WS 19/20, 2 SWS, Language: German, Open in study portal

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes

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

Learning 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.

Workload

regular attendance: 25 hours
self-study: 95 hours

T 6.172 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	Product Lifecycle Management	2 SWS	Lecture (V)	Ovtcharova
Exams					
SS 2019	76-T-MACH-105147	Product Lifecycle Management		Prüfung (PR)	Ovtcharova

Competence Certificate
Writen examination 90 min.

Prerequisites
None

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

V Product Lifecycle Management   Lecture (V)
2121350, WS 19/20, 2 SWS, Language: German, Open in study portal

Learning Content
Product Lifecycle Management (PLM) is an approach to the holistic and cross-company management and control of all product-related processes and data throughout the life cycle along the extended supply chain - from design and production to sales, to the dismantling and recycling.

Product Lifecycle Management is a comprehensive approach for effective and efficient design of the product life cycle. Based on all product information, which comes up across the entire value chain and across multiple partners, processes, methods and tools are made available to provide the right information at the right time, quality and the right place.

The course covers:

- A consistent description of all business processes that occur during the product life cycle (development, production, sales, dismantling, ...)
- the presentation of methods for the performance of the PLM business processes,
- explaining the most important corporate information systems to support the life cycle (PDM, ERP, SCM, CRM systems) to sample the software manufacturer SAP

Workload
regular attendance: 42 hours
self-study: 128 hours

Literature
Lecture slides.

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 6.173 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 Oral examination	**Credits** 4	**Recurrence** Each summer term	**Version** 2

Events					
SS 2019	2123364	Product, Process and Resource Integration in the Automotive Industry	2 SWS	Lecture (V)	Mbang
Exams					
SS 2019	76-T-MACH-102155	Product, Process and Resource Integration in the Automotive Industry	Prüfung (PR)		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 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Learning Content
The lecture

- 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)
- Systems: Siemens NX .

Additionally, A practical industrial project study is offered, which is based on an integrated application scenario (from design of production resources, over testing and validation method planning to the manufacturing and implementation of the production resources).

Since the student will be divided in small teams, this study will also teach the students about team word and distributed development.

Annotation
Max. 20 students, registration necessary (ILIAS)

Workload
regular attendance: 32 hours
self-study: 72 hours

Literature
Lecture slides

T	**6.174 Course: Production Economics and Sustainability [T-WIWI-102820]**

Responsible:	Dr. Jérémy Rimbon
Organisation:	KIT Department of Economics and Management
Part of:	M-WIWI-101437 - Industrial Production I

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

Events					
WS 19/20	2581960	Production Economics and Sustainability	2 SWS	Lecture (V)	Volk
Exams					
SS 2019	7981960	Production Economics and Sustainability		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)**

Learning 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

Workload

Total effort required will account for approximately 105h (3.5 credits).

Literature

will be announced in the course

T 6.175 Course: Project in Applied Remote Sensing [T-BGU-101814]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101646 - Introduction to Natural Hazards and Risk Analysis 1
M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Version
Completed coursework	1	1

Events					
SS 2019	6020245	Projektübung angewandte Fernerkundung	2 SWS	Practice (Ü)	Assistenten, Hinz
Exams					
SS 2019	8284101814	Project in Applied Remote Sensing		Prüfung (PR)	Weidner

T 6.176 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 Written examination	Credits 3	Recurrence Each winter term	Version 2

Events					
WS 19/20	6200106	Projektmanagement	2 SWS	Lecture / Practice (VÜ)	Haghsheno, Schneider
Exams					
SS 2019	8231101675	Project Management		Prüfung (PR)	Haghsheno

Competence Certificate
written exam with 60 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 6.177 Course: Public Law I - Basic Principles [T-INFO-101963]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101187 - Elective Module Law
M-INFO-101192 - Constitutional and Administrative Law

Type	Credits	Recurrence	Version
Written examination	3	Each winter term	2

Events					
WS 19/20	24016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500100	Public Law I - Basic Principles		Prüfung (PR)	Marsch

T   6.178 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 Written examination	Credits 6	Recurrence Each summer term	Version 1

Events					
SS 2019	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture (V)	Marsch
WS 19/20	24016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500298	Public Law I & II		Prüfung (PR)	Marsch

T 6.179 Course: Public Law II - Public Business Law [T-INFO-102042]

Responsible:	Prof. Dr. Nikolaus Marsch
Organisation:	KIT Department of Informatics
Part of:	M-INFO-101187 - Elective Module Law
	M-INFO-101192 - Constitutional and Administrative Law

Type	Credits	Recurrence	Version
Written examination	3	Each summer term	1

Events					
SS 2019	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture (V)	Marsch
Exams					
SS 2019	7500081	Public Law II		Prüfung (PR)	Marsch

T	**6.180 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 Written examination	**Credits** 3	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	24082	Public Media Law	2 SWS	Lecture (V)	Kirchberg
Exams					
SS 2019	7500058	Public Media Law		Prüfung (PR)	Dreier, Matz
WS 19/20	7500062	Public Media Law		Prüfung (PR)	Dreier, Matz

T   6.181 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	2560120	Public Revenues	2 SWS	Lecture (V)	Wigger
SS 2019	2560121	Übung zu Öffentliche Einnahmen	1 SWS	Practice (Ü)	Wigger
Exams					
SS 2019	790oeff	Public Revenues		Prüfung (PR)	Wigger
WS 19/20	790oeff	Public Revenues		Prüfung (PR)	Wigger

Competence Certificate

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Prerequisites

None

Recommendation

Basic knowledge of Public Finance is required.

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

V   Public Revenues
2560120, SS 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

Learning Content

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

Workload

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

Literature
Elective literature:

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4th ed., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I* and *Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2nd ed., Springer

T 6.182 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
Exams					
SS 2019	790oefi	Public Sector Finance		Prüfung (PR)	Wigger
WS 19/20	790oefi	Public Sector Finance		Prüfung (PR)	Wigger

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)

Learning 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.

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.
- Several publications of the Ministry of Interior and the Ministry of Finance Baden-Württemberg.

T 6.183 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	Python for Empirical Finance	2 SWS	Practical course (P)	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)

Description
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.

Learning Content
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

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

T   6.184 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 Written examination	**Credits** 4	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2149667	Quality Management	2 SWS	Lecture (V)	Lanza
Exams					
SS 2019	76-T-MACH-102107	Quality Management		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)**

Description
Media:

Lecture notes will be provided in Ilias (https://ilias.studium.kit.edu/)

Notes

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 denition
- 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

Learning 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 denition
- 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

Annotation

None

Workload

regular attendance: 21 hours
self-study: 99 hours

T   6.185 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	Real Estate Management I	2 SWS	Lecture (V)	Lützkendorf, Worschech
WS 19/20	2586401	Übungen zu Real Estate Management I	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 (winter semester). Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Annotation

The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

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

V   Real Estate Management I
2586400, WS 19/20, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description

The course Real Estate Management I deals with questions concerning the economy of a single building througout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.
The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

Learning Content

The course Real Estate Management I deals with questions concerning the economy of a single building througout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.
The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

Annotation

The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

Workload

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

Literature
Elective literature:

- 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 6.186 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 2019	2585400	Real Estate Management II	2 SWS	Lecture (V)	Lützkendorf, Worschech
SS 2019	2585401	Übung zu Real Estate Management II	2 SWS	Practice (Ü)	Worschech
Exams					
SS 2019	7900172	Real Estate Management II		Prüfung (PR)	Lützkendorf
SS 2019	7900173	Real Estate Management II		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 (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 I* is recommended.
Furthermore it is recommeded to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Annotation
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

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

V Real Estate Management II
2585400, SS 2019, 2 SWS, Language: German, Open in study portal

Lecture (V)

Description
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.

Notes
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

Learning 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.

Annotation
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

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

Literature
Elective literature:

See german version.

T   6.187 Course: Remote Sensing, Exam [T-BGU-101636]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101646 - Introduction to Natural Hazards and Risk Analysis 1
M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type	Credits	Recurrence	Version
Oral examination	4	Each summer term	1

Events					
SS 2019	6020241	Fernerkundungssysteme	1 SWS	Lecture (V)	Hinz
SS 2019	6020242	Fernerkundungssysteme, Übung	1 SWS	Practice (Ü)	Weidner
SS 2019	6020243	Fernerkundungsverfahren	2 SWS	Lecture (V)	Weidner
SS 2019	6020244	Fernerkundungsverfahren, Übung	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2019	8284101636	Remote Sensing, exam		Prüfung (PR)	Weidner, Hinz

Recommendation
None

| T | 6.188 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	Renewable Energy – Resources, Technologies and Economics	2 SWS	Lecture (V)	McKenna, Jochem
Exams					
SS 2019	7981012	Renewable Energy-Resources, Technologies and Economics		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	Lecture (V)
	2581012, WS 19/20, 2 SWS, Language: English, Open in study portal	

Learning 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

Workload

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

Literature
Elective literature:

- Kaltschmitt, M., 2006, Erneuerbare Energien : Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, aktualisierte, korrigierte und ergänzte Auflage Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.
- Kaltschmitt, M., Streicher, W., Wiese, A. (eds.), 2007, Renewable Energy: Technology, Economics and Environment, Springer, Heidelberg.
- Quaschning, V., 2010, Erneuerbare Energien und Klimaschutz : Hintergründe - Techniken - Anlagenplanung – Wirtschaftlichkeit München : Hanser, Ill.2., aktualis. Aufl.
- Harvey, D., 2010, Energy and the New Reality 2: Carbon-Free Energy Supply, Eathscan, London/Washington.
- Boyle, G. (ed.), 2004, Renewable Energy: Power for a Sustainable Future, 2nd Edition, Open University Press, Oxford.

T   **6.189 Course: Selected Legal Isues 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 Examination of another type	Credits 3	Recurrence Each summer term	Version 1

Events					
SS 2019	24821	Selected legal issues of Internet law	2 SWS	Colloquium (KOL)	Dreier
Exams					
SS 2019	7500226	Selected legal issues of Internet law		Prüfung (PR)	Dreier

T 6.190 Course: Selected Topics on Optics and Microoptics for Mechanical Engineers [T-MACH-102165]

Responsible:	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

T   6.191 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 Examination of another type	**Credits** 3	**Recurrence** Each term	**Version** 1

Events					
SS 2019	2151643	Seminar Data Mining in Production	2 SWS	Seminar (S)	Lanza
WS 19/20	2151643	Seminar Data Mining in Production	2 SWS	Seminar (S)	Lanza
Exams					
SS 2019	76-T-MACH-108737	Seminar Data-Mining in Production		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, SS 2019, 2 SWS, Language: German, Open in study portal   **Seminar (S)**

Description
Media:

KNIME Analytics Platform

Notes

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

Learning 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.

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.

Workload

regular attendance: 10 hours
self-study: 80 hours

V	**Seminar Data Mining in Production** 2151643, WS 19/20, 2 SWS, Language: German, Open in study portal	**Seminar (S)**

Description
Media:

KNIME Analytics Platform

Notes

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

Learning 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.

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.

Workload

regular attendance: 10 hours
self-study: 80 hours

T **6.192 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 Examination of another type	Credits 3	Recurrence Each term	Version 1

Events					
SS 2019	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar (S)	Ruckes, Hoang, Benz, Strych, Luedecke, Silbereis, Stengel, Schubert
SS 2019	2530580	Seminar in Finance (Master, Prof. Uhrig-Homburg)	2 SWS	Seminar (S)	Uhrig-Homburg, Hofmann, Reichenbacher, Eska
SS 2019	2540524	Bachelor Seminar aus CRM (nur Bachelor)	2 SWS	Seminar (S)	Geyer-Schulz, Schweigert, Schweizer
SS 2019	2571180	Seminar in Marketing und Vertrieb (Bachelor)	2 SWS	Seminar (S)	Klarmann, Assistenten
SS 2019	2573010	Seminar Human Resources and Organizations (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2573011	Seminar Human Resource Management (Bachelor)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2579904	Seminar Management Accounting	2 SWS	Seminar (S)	Hammann, Disch
SS 2019	2579905	Special Topics in Management Accounting	2 SWS	Seminar (S)	Mickovic, Riar
SS 2019	2581977	Seminar Produktionswirtschaft und Logistik II	2 SWS	Seminar (S)	Schultmann
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, Pusmaz, 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
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
Exams					
SS 2019	00019	Seminar Digital Service Innovation		Prüfung (PR)	Satzger
SS 2019	7900003	Seminar in Finance (Bachelor, Prof. Ruckes)		Prüfung (PR)	Ruckes
SS 2019	7900013	Bachelor Seminar in CRM		Prüfung (PR)	Geyer-Schulz
SS 2019	7900021	Seminar in Marketing and Sales (Bachelor)		Prüfung (PR)	Klarmann
SS 2019	7900056	Entrepreneurship Basics (Track 1)		Prüfung (PR)	Terzidis
SS 2019	7900057	Entrepreneurship Basics (Track 2)		Prüfung (PR)	Terzidis
SS 2019	7900093	Seminar in Business Administration A		Prüfung (PR)	Weinhardt
SS 2019	7900180	Seminar in Business Administration		Prüfung (PR)	Weinhardt
SS 2019	7900256	Seminar Electronic Markets & User Behavior		Prüfung (PR)	Weinhardt
SS 2019	7900261	Information Systems and Design (ISSD) Seminar		Prüfung (PR)	Mädche
SS 2019	7900262	Practical Seminar: Information Systems and Service Design / Seminarpraktikum: Information Systems und Service Design		Prüfung (PR)	Mädche
SS 2019	7900265	Interactive Analytics Seminar		Prüfung (PR)	Mädche
SS 2019	7900286	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Lützkendorf
SS 2019	7900288	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Lützkendorf
SS 2019	7900294	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Lützkendorf
SS 2019	79-2579904-01	Seminar Management Accounting (Bachelor)		Prüfung (PR)	Wouters
SS 2019	79-2579905-01	Seminar Special Topics in Management Accounting (Bachelor)		Prüfung (PR)	Wouters
SS 2019	7981976	Seminar in Production and Operations Management I		Prüfung (PR)	Schultmann
SS 2019	7981978	Seminar in Production and Operations Management III		Prüfung (PR)	Schultmann
SS 2019	7981979	Seminar Energy Economics I		Prüfung (PR)	Fichtner
SS 2019	7981981	Seminar Energy Economics III		Prüfung (PR)	Fichtner
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

Competence Certificate
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

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

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

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

V	**Seminar in Finance (Master, Prof. Uhrig-Homburg)** 2530580, SS 2019, 2 SWS, Language: German, Open in study portal	**Seminar (S)**

Learning Content
Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.

The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

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

Literature
Will be announced at the end of the foregoing semester.

V	**Seminar Human Resources and Organizations (Bachelor)** 2573010, SS 2019, 2 SWS, Open in study portal	**Seminar (S)**

Notes
See Module Handbook

V	**Seminar Human Resource Management (Bachelor)** 2573011, SS 2019, 2 SWS, Open in study portal	**Seminar (S)**

Notes
See Module Handbook

V	**Seminar Management Accounting** 2579904, SS 2019, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Notes
see Module Handbook

Learning Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

Annotation

Maximum of 24 students.

Workload

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

Literature

Will be announced in the course.

V	**Special Topics in Management Accounting** 2579905, SS 2019, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Notes

see Module Handbook

Learning Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four meetings that are spread throughout the semester.

Meeting 1: Introductory lecture. You need to conduct a first literature search and at the end of the first week you should identify (provisionally) the topic for your paper.

Meeting 2 and 3: The purpose of the second week is to define the topics and research questions in much more detail. Different types of papers may be selected: literature review, research paper, descriptive case study, or teaching case. Students will present their ideas and all participants should ask questions, help each other focus, offer ideas, etc.

Meeting 4: In the third week we are going to present and discuss the final papers.

Annotation

Maximum of 24 students.

Workload

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

Literature

Will be announced in the course.

V	**Seminar in Empirical Finance** 2500028, WS 19/20, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Description

The aim of this seminar is to introduce the student to empirical data work in financial economics and investments.

V	**Data Science in Service Management** 2540473, WS 19/20, 2 SWS, Language: German/English, Open in study portal	**Seminar (S)**

Notes

wird auf deutsch und englisch gehalten

V	**Bachelor Seminar aus Data Science**	**Seminar (S)**
	2540524, WS 19/20, 2 SWS, Language: German, Open in study portal	

Workload

The total workload for this course is approximately 90 hours (3 credits):

Time of attendance

- Introductory lessons: 4 x 90min = 6h 00m
- Presentations: 4 x 90min = 6h 00m

Selbststudium

- Preparing the presentation: 8h
- Literature research: 40h
- Writing the seminar paper: 30h

Summe: 90h 00m

Literature
Elective literature:

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

V	**Entrepreneurship Basics (Track 2)**	**Seminar (S)**
	2545011, WS 19/20, 2 SWS, Language: German, Open in study portal	

Annotation
Please register on the seminar website.

V	**Seminar: Human Resources and Organizations (Bachelor)**	**Seminar (S)**
	2573010, WS 19/20, 2 SWS, Open in study portal	

Notes
See Module Handbook

V	**Seminar: Human Resource Management (Bachelor)**	**Seminar (S)**
	2573011, WS 19/20, 2 SWS, Open in study portal	

Notes
See Module Handbook

V	**Seminar Management Accounting - Special Topics**	**Seminar (S)**
	2579919, WS 19/20, 2 SWS, Language: English, Open in study portal	

Notes
see Module Handbook

Learning Content
The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in four to five meetings that are spread throughout the semester.

Annotation
Maximum of 24 students.

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

Literature
Will be announced in the course.

T 6.193 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 Examination of another type	**Credits** 3	**Recurrence** Each term	**Version** 1

Events					
SS 2019	2560241	Digital IT Solutions and Services transforming the Field of Public Transportation	2 SWS	Prüfung (PR)	Janoshalmi
SS 2019	2560553	Topics in Political Economics (Bachelor)	2 SWS	Seminar (S)	Szech, Maus
SS 2019	2560555	Morals and Social Behavior (Bachelor)	2 SWS	Seminar (S)	Szech, Huber
WS 19/20	2521310	Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görgen
WS 19/20	2560140	Topics on Political Economics (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 on Political Economics (Master)	2 SWS	Seminar (S)	Ehrlich, Huber
WS 19/20	2561208	Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung	1 SWS	Seminar (S)	Szimba
Exams					
SS 2019	7900130	Seminar in Economics (Bachelor)		Prüfung (PR)	Szech
SS 2019	7900131	Seminar in Economics (Bachelor)		Prüfung (PR)	Szech
SS 2019	7900147	Seminar in Economics (Bachelor)		Prüfung (PR)	Fuchs-Seliger
SS 2019	7900200	Seminar: Behavioral Game Theory		Prüfung (PR)	Puppe
SS 2019	7900222	Seminar in Economics B (Master)		Prüfung (PR)	Melik-Tangian
SS 2019	7900237	Seminar Strategic Decisions		Prüfung (PR)	Ehrhart
SS 2019	7900267	Seminar in Macroeconomics I		Prüfung (PR)	Scheffel
SS 2019	7900271	Seminar in Macroeconomics II		Prüfung (PR)	Scheffel
SS 2019	791192ee	Topics in Experimental Economics		Prüfung (PR)	Reiß
SS 2019	79sefi1	Seminar Infrastructure and Science Networks (Bachelor)		Prüfung (PR)	Wigger
WS 19/20	7900132	Seminar in Economics A (Master)		Prüfung (PR)	Fuchs-Seliger
WS 19/20	79sefi1	Seminar in Economics (Bachelor)		Prüfung (PR)	Wigger

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation

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

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

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

	Topics in Political Economics (Bachelor)	
V	2560553, SS 2019, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Description

In many companies relative reward schemes are used whereby employees earn a bonus if they perform better than their colleagues. Moreover, hierarchical structures mean that in many organizations, employees find themselves in constant competition for promotions. This is meant to provide incentives for higher performance. However, competitive remuneration schemes could also have detrimental effects such that individual workers may view their colleagues as direct competitors generating more selfish and/or less helpful behavior in the workplace. Furthermore, age, gender and culture seem to have impacts on willingness to compete. For example, in western cultures, adult men sometimes enter competition even though their performance level is way too low for success, i.e., they harm themselves by over-competitiveness. In contrast, adult females sometimes compete less than they could do successfully.

Another challenge in contest design, e.g. in sports, is that when competition takes place among workers with mixed abilities it may lead to a discouragement effect, which establishes that lower ability individuals often reduce effort competing against an individual they do not feel up to (e.g. it has been found that average golf players performed significantly worse when competing against a superstar like Tiger Woods). One solution suggested by the economic literature is to level the playing field between advantaged and disadvantaged individuals by favoring weaker individuals through bid-caps, asymmetric tie-breaking rules, or advances. In sports, asymmetric tie-breaking is already common, for instance, in the
Champions League soccer playoffs "away goals" become the decisive factor in determining the winning team in case of a tie.

Contests are not only a well-established mechanism for incentivizing workers but also for encouraging innovation and advancing R&D. Elements of research and innovation contests can be found in the procurement of various goods and services. For instance, the construction of new buildings, proposals in a venture capital firm or TV shows for entertainment companies all flow through a similar innovation process that involves the solicitation of bids from multiple potential suppliers and the preparation of a pilot or a proposal. In other cases, e.g., in lobbying contests, it is often discussed whether investments are beneficial or not. Some authors have argued that investments into lobbying should be capped in order to soften competition among asymmetrically strong interest groups (e.g. the lobbying industry versus consumers' interest groups). Of course, then the question arises whether such caps achieve the respective design goal or not.

In this seminar, we discuss questions like: How can we design workplaces and labor contracts to increase motivation and productivity? How can contests be used to foster innovation? Which role should social preferences play and how could they inspire specific contest designs? How should sport contests be engineered depending on the respective goals? How should we design lobbying contests?

Also related topics are very welcome!

Notes

Participation will be limited to 12 students.

Annotation

For further questions, please contact Patrick Maus (Patrick.Maus@kit.edu).

Workload

About 90 hours

Literature

Charness, G., Kuhn, P. (2011) Lab labor: What can labor economists learn from the lab? Handbook of labor economics, 4, 229-330.

Cassar, A., Friedman, D. (2004) Economics lab: an intensive course in experimental economics. Routledge.

Croson, R., Gneezy, U. (2009). Gender differences in preferences. Journal of Economic literature, 47(2), 448-474.

Dechenaux, Emmanuel, Dan Kovenock, and Roman M. Sheremeta. "A survey of experimental research on contests, all-pay auctions and tournaments." Experimental Economics 18.4 (2015): 609-669.

V	**Morals and Social Behavior (Bachelor)** 2560555, SS 2019, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Description

For a long time, economists studied given markets and mechanisms to predict outcomes, future developments or generally the participants' behavior. In contrast, Market Design uses theory, empirical and experimental work to design markets which incentivize their participants in a way that leads to a "desirable" outcome. In this, the designer can have different objectives, for example: Maximizing efficiency, welfare or minimizing negative externalities.

Prominent applications of Market Design include, quite topical, Germany's auction of 5G mobile licenses and matching markets, where there are two large populations that need to be matched to one another (think of hospitals and interns, students and dorm rooms or kidney donors and receivers). In this seminar, we think about ways to either design new markets or how we could alter existing ones in a socially beneficial way. Alternatively, research ideas could focus on finding failures or shortcomings of ineffectively designed markets.

Notes

Participation will be limited to 12 students.

Annotation

For further questions, please contact David Huber (david.huber@kit.edu).

Workload

About 90 hours.

V	**Topics in Econometrics** 2521310, WS 19/20, 2 SWS, Language: German, Open in study portal	**Seminar (S)**

Annotation

In the winter semester 2018/19 the course will be held in English.

V	**Topics on Political Economics (Bachelor)** 2560140, WS 19/20, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Workload

About 90 hours.

V	**Topics on Political Economics (Master)** 2560142, WS 19/20, 2 SWS, Language: English, Open in study portal	**Seminar (S)**

Workload

About 90 hours.

T   6.194 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

Exams				
SS 2019	7311633	Seminar Creating a Patent Specification	Prüfung (PR)	Stork
SS 2019	76-T-MACH-00002	Seminar for Rail System Technology	Prüfung (PR)	Gratzfeld

Competence Certificate
See German version.

Prerequisites
See module description.

Recommendation
None

T 6.195 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 Examination of another type	Credits 3	Recurrence Each term	Version 1

Events					
SS 2019	2512300	Knowledge Discovery and Data Mining	3 SWS		Sure-Vetter, Färber, Nguyen, Weller
SS 2019	2513200	Seminar Betriebliche Informationssysteme: Datenschutz und IT-Sicherheit (Bachelor)	2 SWS	Seminar (S)	Oberweis, Raabe, Volkamer, Aldag, Alpers, Fritsch, Mucha, Wagner, Schiefer, Landesberger von Antburg
SS 2019	2513306	Data Science & Real-time Big Data Analytics	2 SWS		Sure-Vetter, Riemer, Zehnder
SS 2019	2513400	Emerging Trends in Critical Information Infrastructures	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
SS 2019	2595470	Seminar Service Science, Management & Engineering	2 SWS	Seminar (S)	Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm
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, Hartmann , 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
Exams					
SS 2019	7900087	Seminar Business Information Systems: Privacy and IT Security (Bachelor)		Prüfung (PR)	Oberweis
SS 2019	7900090	Data Science & Real-time Big Data Analytics		Prüfung (PR)	Sure-Vetter
SS 2019	7900092	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter
SS 2019	7900094	Knowledge Discovery and Data Mining		Prüfung (PR)	Sure-Vetter
SS 2019	7900187	Emerging Trends in Critical Information Infrastructures		Prüfung (PR)	Sunyaev
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	7900129	Security and Privacy Awareness		Prüfung (PR)	Volkamer
WS 19/20	7900187	Real-World Challenges in Data Science und Analytics		Prüfung (PR)	Sure-Vetter

Competence Certificate
Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites
None.

Recommendation
See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation
Placeholder for seminars offered by the Institute AIFB. 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	**Knowledge Discovery and Data Mining**
	2512300, SS 2019, 3 SWS, Language: English, Open in study portal

Description
The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

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

Learning Content
Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

Literature
Detailed references are indicated together with the respective subjects. For general background information look up the following textbooks:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

V	**Data Science & Real-time Big Data Analytics**
	2513306, SS 2019, 2 SWS, Language: German/English, Open in study portal

Description
Event processing and real-time data are everywhere: financial market data, sensors, business intelligence, social media analytics, logistics. Many applications collect large volumes of data in real time and are increasingly faced with the challenge of being able to process them quickly and react promptly. The challenges of this real-time processing are currently also receiving a great deal of attention under the term "Big Data". The complex processing of real-time data requires both knowledge of methods for data analysis (data science) and their processing (real-time analytics). Seminar papers are offered on both of these areas as well as on interface topics, the input of own ideas is explicitly desired.

V	**Seminar Service Science, Management & Engineering**	**Seminar (S)**
	2595470, SS 2019, 2 SWS, Language: German, Open in study portal	

Learning Content

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload

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

Literature

The student will receive the necessary literature for his research topic.

V	**Linked Data and the Semantic Web**
	2512301, WS 19/20, 3 SWS, Language: German/English, Open in study portal

Notes

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

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

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

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

Topics of interest include, but are not limited to:

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

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

V	**Real-World Challenges in Data Science and Analytics**
	2512311, WS 19/20, 3 SWS, Language: German/English, Open in study portal

Notes

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

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

V	**Seminar Business Information Systems: Programming 3 (Bachelor)**	**Seminar (S)**
	2513200, WS 19/20, 2 SWS, Open in study portal	

Notes

Registration information and the content of the seminar will be announced on the course page. Only bachelor students are allowed to attend this seminar.

| V | **Seminar Service Science, Management & Engineering**
2595470, WS 19/20, 3 SWS, Language: German, Open in study portal | **Seminar (S)** |

Notes

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

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.

T   6.196 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

T 6.197 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					
SS 2019	2550132	Seminar zur Mathematischen Optimierung (MA)	2 SWS	Seminar (S)	Stein, Mohr, Neumann
SS 2019	2550472	Seminar on Power Systems Optimization (Bachelor)	2 SWS	Seminar (S)	Rebennack, Assistenten
SS 2019	2550491	Seminar zur diskreten Optimierung	SWS	Block (B)	Nickel, Mitarbeiter
WS 19/20	2550131	Seminar zu Methodischen Grundlagen des Operations Research	SWS	Seminar (S)	Stein
WS 19/20	2550472	Seminar on Power Systems Optimization (Bachelor)	2 SWS	Seminar (S)	Rebennack, Sinske
WS 19/20	2550491	Seminar: Modern OR and Innovative Logistics	2 SWS	Seminar (S)	Nickel, Mitarbeiter
Exams					
SS 2019	00024	Seminar in Operations Research (Bachelor)	Prüfung (PR)	Nickel	
SS 2019	7900017_SS2019	Seminar in Operations Research (Bachelor)	Prüfung (PR)	Stein	
SS 2019	7900249	Seminar in Operations Research (Bachelor)	Prüfung (PR)	Nickel	

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation

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

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

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

V Seminar zur diskreten Optimierung
2550491, SS 2019, SWS, Language: German, Open in study portal   **Block (B)**

Learning Content

The topics of the seminar will be announced at the beginning of the term in a preliminaty meeting. Dates will be announced on the internet.

Annotation

The seminar is offered in each term.

Workload

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

Literature

Literature and relevant sources will be announced at the beginning of the seminar.

V	**Seminar zu Methodischen Grundlagen des Operations Research** 2550131, WS 19/20, SWS, Language: German, Open in study portal	Seminar (S)

Learning Content

The current seminar topics are announced under http://kop.ior.kit.edu at the end of the preceding semester.

Workload

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

Literature

References and relevant sources are announced at the beginning of the seminar.

V	**Seminar: Modern OR and Innovative Logistics** 2550491, WS 19/20, 2 SWS, Language: German, Open in study portal	Seminar (S)

Learning Content

The topics of the seminar will be announced at the beginning of the term in a preliminaty meeting. Dates will be announced on the internet.

Annotation

The seminar is offered in each term.

Workload

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

Literature

Literature and relevant sources will be announced at the beginning of the seminar.

T 6.198 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	Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görgen
Exams					
SS 2019	7900250	Data Mining and Applications (Projectseminar)	Prüfung (PR)	Nakhaeizadeh	

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

Annotation

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

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

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

V Topics in Econometrics
2521310, WS 19/20, 2 SWS, Language: German, Open in study portal   **Seminar (S)**

Annotation

In the winter semester 2018/19 the course will be held in English.

T 6.199 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 2019	2149665	Seminar Production Technology	1 SWS	Seminar (S)	Fleischer, Lanza, Schulze, Zanger
Exams					
SS 2019	76-T-MACH-109062	Seminar Production Technology		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**	Seminar (S)
	2149665, SS 2019, 1 SWS, Language: German, Open in study portal	

Description
The specific topics are published on the homepage of the wbk Institute of Production Science.

Notes

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

Learning 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.

Workload

regular attendance: 10 hours
self-study: 80 hours

T 6.200 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 Examination of another type	Credits 3	Recurrence Each term	Version 1

Events					
SS 2019	2400041	Governance, Risk & Compliance	2 SWS	Seminar (S)	Herzig
SS 2019	2400061	Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung	2 SWS	Seminar (S)	Bless, Boehm, Hartenstein, Mädche, Sunyaev, Zitterbart
SS 2019	24820	Current Issues in Patent Law	2 SWS	Seminar (S)	Melullis
WS 19/20	24389	IT-Sicherheit und Recht	2 SWS	Seminar (S)	Schallbruch
Exams					
SS 2019	7500106	Title not available		Prüfung (PR)	Bless, Hartenstein, Mädche, Zitterbart, Boehm, Sunyaev
SS 2019	7500140	Seminar: Legal Studies I		Prüfung (PR)	Dreier, Matz, Boehm
SS 2019	7500159	Seminar: Legal Studies I		Prüfung (PR)	Marsch

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

V Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung Seminar (S)
2400061, SS 2019, 2 SWS, Open in study portal

Notes
Registration via https://portal.wiwi.kit.edu/ys/2708

| T | **6.201 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 Written examination	**Credits** 3	**Recurrence** Each winter term	**Version** 1

Events					
WS 19/20	2572158	Services Marketing and B2B Marketing	2 SWS	Lecture (V)	Klarmann
Exams					
WS 19/20	7900081	Services Marketing and B2B Marketing		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).

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)** |

Learning 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

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

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

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

T 6.202 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 Completed coursework (written)	**Credits** 3	**Recurrence** Each winter term	**Version** 1

Events					
SS 2019	5011003	Sozialforschung: What does the minimum wage do?	2 SWS	Seminar (S)	Binder
SS 2019	5011008	Sozialforschung: Reflexive Wissenssoziologie	2 SWS	Seminar (S)	Kauppert
SS 2019	5011013	Sozialforschung: Ökonomische Ungleichheit	2 SWS	Seminar (S)	Binder
SS 2019	5011019	Sozialforschung: Theorien der Moderne	2 SWS	Seminar (S)	Kauppert
WS 19/20	5011011	Economic inequality	2 SWS	Seminar (S)	Binder
WS 19/20	5011014	Sociology of Technology	SWS	Seminar (S)	Lösch
Exams					
SS 2019	7400379	Social Science A		Prüfung (PR)	Nollmann
SS 2019	7400454	Social Science A (WiWi)		Prüfung (PR)	Nollmann

T 6.203 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 Completed coursework (written)	Credits 3	Recurrence Each winter term	Version 1

Events					
WS 19/20	5011011	Economic inequality	2 SWS	Seminar (S)	Binder
WS 19/20	5011014	Sociology of Technology	SWS	Seminar (S)	Lösch
Exams					
SS 2019	7400455	Social Science B (WiWi)		Prüfung (PR)	Nollmann

T 6.204 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				
SS 2019	7900224	Special Topics in Information Systems	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 pracitical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Prerequisites
see below

Recommendation
None

Annotation

All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Systems course. The current topics of the practical seminars are available at the following homepage: www.iism.kit.edu/im/lehre

The Special Topics Information Systems is equivalent to the practical seminar, as it was only offered for the major in "Information 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 6.205 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-101599 - Statistics and Econometrics
	M-WIWI-101608 - Statistics and Econometrics

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

Events					
WS 19/20	2521350	Statistische Modellierung von Allgemeinen Regressionsmodellen	2 SWS	Lecture (V)	Heller

Competence Certificate

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

Prerequisites

None

Recommendation

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

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

V Statistische Modellierung von Allgemeinen Regressionsmodellen
2521350, WS 19/20, 2 SWS, Open in study portal
Lecture (V)

Annotation

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

Workload

The total workload for this course is approximately 135 hours (4.5 credits).

regular attendance: 30 hours

self-study: 65 hours

exam preparation: 40 hours

T 6.206 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 Written examination	Credits 5	Recurrence Each summer term	Version 1

Events					
SS 2019	2600008	Statistics I	4 SWS	Lecture (V)	Schienle
SS 2019	2600009	Tutorien zu Statistik I	2 SWS	Practice (Ü)	Schienle, Rüter, Bitzer
Exams					
SS 2019	7900230	Statistics I		Prüfung (PR)	Schienle
WS 19/20	7900009	Statistics I		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 2019, 4 SWS, Language: German, Open in study portal

Lecture (V)

Learning 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

150 hours (5.0 Credits).

Literature

Skriptum: Kurzfassung Statistik I

Elective literature:

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 6.207 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	Statistics II	4 SWS	Lecture (V)	Schienle
WS 19/20	2610021		2 SWS	Tutorial (Tu)	Schienle, Rüter, Zerwas
WS 19/20	2610022	PC-Praktikum zu Statistik II	2 SWS		Schienle, Görgen
Exams					
SS 2019	7900029	Statistics II		Prüfung (PR)	Grothe

Competence Certificate

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

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

Prerequisites

None

Recommendation

It ist recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

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

V Statistics II
2610020, WS 19/20, 4 SWS, Language: German, Open in study portal

Lecture (V)

Learning 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

Workload

150 hours (5.0 Credits).

Literature

Script: Kurzfassung Statistik II

Elective literature:

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   6.208 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	Strategic Finance and Technology Change	1 SWS	Lecture (V)	N.N.

Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

Prerequisites

None

Recommendation

Attending the lecture "Financial Management" is strongly recommended.

T 6.209 Course: Systems of Remote Sensing, Prerequisite [T-BGU-101637]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101646 - Introduction to Natural Hazards and Risk Analysis 1
                   M-WIWI-101648 - Introduction to Natural Hazards and Risk Analysis 2
                   M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis

Type Completed coursework	Credits 1	Recurrence Each summer term	Version 1

Events					
SS 2019	6020242	Fernerkundungssysteme, Übung	1 SWS	Practice (Ü)	Weidner
Exams					
SS 2019	8284101637	Systems of Remote Sensing, Prerequisite		Prüfung (PR)	Weidner

Prerequisites
None

Recommendation
None

Annotation
None

T 6.210 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 2019	2550486	Taktisches und operatives SCM	2 SWS	Lecture (V)	Nickel
SS 2019	2550487	Übungen zu Taktisches und operatives SCM	1 SWS	Practice (Ü)	Pomes
Exams					
SS 2019	00026	Tactical and Operational Supply Chain Management		Prüfung (PR)	Nickel

Competence Certificate

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

The exam takes place in every the semester.

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

Prerequisites

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

Recommendation

None

Annotation

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

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

V Taktisches und operatives SCM

2550486, SS 2019, 2 SWS, Language: German, Open in study portal   **Lecture (V)**

Description

Since the classical work 'Theory of the Location of Industries' of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connectedto strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.
Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

Learning Content

The lecture covers basic quantitative methods in location planning in the context of strategic Supply Chain Planning. Besides the discussion of several criteria for the evaluation of the locations of facilities, the students are acquainted with classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models).The exercisesaccompanying the lecture offer the possibility to apply the considered models to practical problems.

Annotation

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

Literature
Elective Literature

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

T 6.211 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 Written examination	Credits 3	Recurrence Each winter term	Version 1

Events					
WS 19/20	24168	Tax Law I	2 SWS	Lecture (V)	Dietrich
Exams					
SS 2019	7500052	Tax Law I		Prüfung (PR)	Dreier, Matz
WS 19/20	7500066	Tax Law I		Prüfung (PR)	Dreier, Matz

T 6.212 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 2019	24646	Tax Law II	2 SWS	Lecture (V)	Dietrich
Exams					
SS 2019	7500053	Tax Law II		Prüfung (PR)	Dreier, Matz
WS 19/20	7500067	Tax Law II		Prüfung (PR)	Dreier, Matz

T   6.213 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 Written examination	**Credits** 3	**Recurrence** Each summer term	**Version** 1

Events					
SS 2019	24632	Telekommunikationsrecht	2 SWS	Lecture (V)	Hermstrüwer
Exams					
SS 2019	7500085	Telecommunications Law		Prüfung (PR)	Marsch

T 6.214 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 Written examination	Credits 3	Recurrence Each term	Version 1

Events					
WS 19/20	24136	Trademark and Unfair Competition Law	2 SWS	Lecture (V)	Matz
Exams					
SS 2019	7500051	Trademark and Unfair Competition Law		Prüfung (PR)	Dreier, Matz
WS 19/20	7500061	Trademark and Unfair Competition Law		Prüfung (PR)	Dreier, Matz

T 6.215 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 Examination of another type	Credits 4	Recurrence Each term	Version 2

Events					
WS 19/20	2123375	Virtual Reality Practical Course	3 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
Exams					
SS 2019	76-T-MACH-102149	Virtual Reality Practical Course		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)**

Learning Content
The lab course consists of:

1. Introduction and basics in virtual reality (hardware, software, application)
2. Introduction in 3DVIA Virtools tool kit as an application development system
3. IMplermentation and practice by developing a driving simulator in small groups.

| T | **6.216 Course: Visual Computing [T-WIWI-110108]** |

Responsible: Dr. Tatiana Landesberger von Antburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Emphasis Informatics
M-WIWI-101426 - Electives in Informatics

Type Written examination	**Credits** 4,5	**Recurrence** Once	**Version** 2

Events					
SS 2019	2500005	Visual Computing	2 SWS	Lecture (V)	Landesberger von Antburg
SS 2019	2500009	Exercise Visual Computing	1 SWS	Practice (Ü)	Landesberger von Antburg
Exams					
SS 2019	7900069	Visual Computing		Prüfung (PR)	Landesberger von Antburg

Competence Certificate

The examination is offered for first writers only in the summer semester 2019. The repeat exam will take place in the winter semester 2019/2020 (only for "repeaters").

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.

Prerequisites

None.

Annotation

The lecture will be offered once in the summer semester 2019.

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

| V | **Visual Computing**
2500005, SS 2019, 2 SWS, Open in study portal | **Lecture (V)** |

Learning Content

The lecture will provide basic knowledge about various aspects of visual computing - visualization of data, and processing of visual information. Course content will have application context of business, transport and business.
Content will include data visualization of business and operational data (2D, 3D and multivariate data, time series, networks) perceptual aspects, visual design, color design, interaction, as well as basics of image processing and object recognition.

Workload

Total effort for 5 credit points: approx. 150 hours.

Literature

Literature recommendations are regularly updated and include, for example:

- R. Szeliski, "Computer Vision: Algorithms and Applications", Springer 2011
- B. Blundell, An Introduction to Computer Graphics and Creative 3D Environments, Springer 2008

| V | **Exercise Visual Computing**
2500009, SS 2019, 1 SWS, Open in study portal | **Practice (Ü)** |

Notes
Please note that the exercise does not begin until the second week of lectures.

T	**6.217 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 Written examination	**Credits** 4,5	**Recurrence** Each summer term	**Version** 2

Events					
SS 2019	2520517	Welfare Economics	SWS	Lecture (V)	Puppe, Rollmann
SS 2019	2520518	Übung zur Wohlfahrtstheorie	SWS	Practice (Ü)	Puppe, Rollmann
Exams					
SS 2019	7900226	Welfare Economics		Prüfung (PR)	Puppe
SS 2019	7900285	Welfare Economics		Prüfung (PR)	Puppe

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

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

V	**Welfare Economics** 2520517, SS 2019, SWS, Language: German, Open in study portal	**Lecture (V)**

Learning Content

The lecture "Welfare economics" deals with the question of efficiency and distributional properties of economic allocations, in particular allocations of market equilibria. The lecture is based on the two welfare theorems: The first welfare theorem (under weak preconditions) says that every competitive equilibrium is efficient.

According to the second welfare theorem (under stronger preconditions), every efficient allocation can be preserved as a competitive equilibrium through adequate choices of initial endowments. Afterwards, the terms and definitions of envy-freeness and the related concept of egalitarian equivalence in the context of the general theory of equilibrium will be discussed.

The second part of the lecture deals with the principle of "social justice" (i.e. distributational justice).The fundamental principles of utilitarism, Rawl's theory of justice as well as John Roemer's theory of equality of opportunity are explained and critically analyzed.

Annotation

The course will be held every two years in the summer.

Workload

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

Literature
Elective literature:

- J. Rawls: *A Theory of Justice.* Harvard University Press (1971)
- J. Roemer: *Theories of Distributive Justice.* Harvard University Press (1996)

T   6.218 Course: Wildcard eBusiness and Service Management [T-WIWI-109808]

Organisation: University

Part of: M-WIWI-101434 - eBusiness and Service Management

Type	Credits	Version
Examination of another type	4,5	1

T   6.219 Course: Wildcard Supply Chain Management [T-WIWI-109802]

Organisation: University
Part of: M-WIWI-101421 - Supply Chain Management

Type	Credits	Version
Examination of another type	4,5	1

T   6.220 Course: Wildcard Supply Chain Management [T-WIWI-109803]

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Type	Credits	Version
Examination of another type	4,5	1