Karlsruher Institut für Technologie

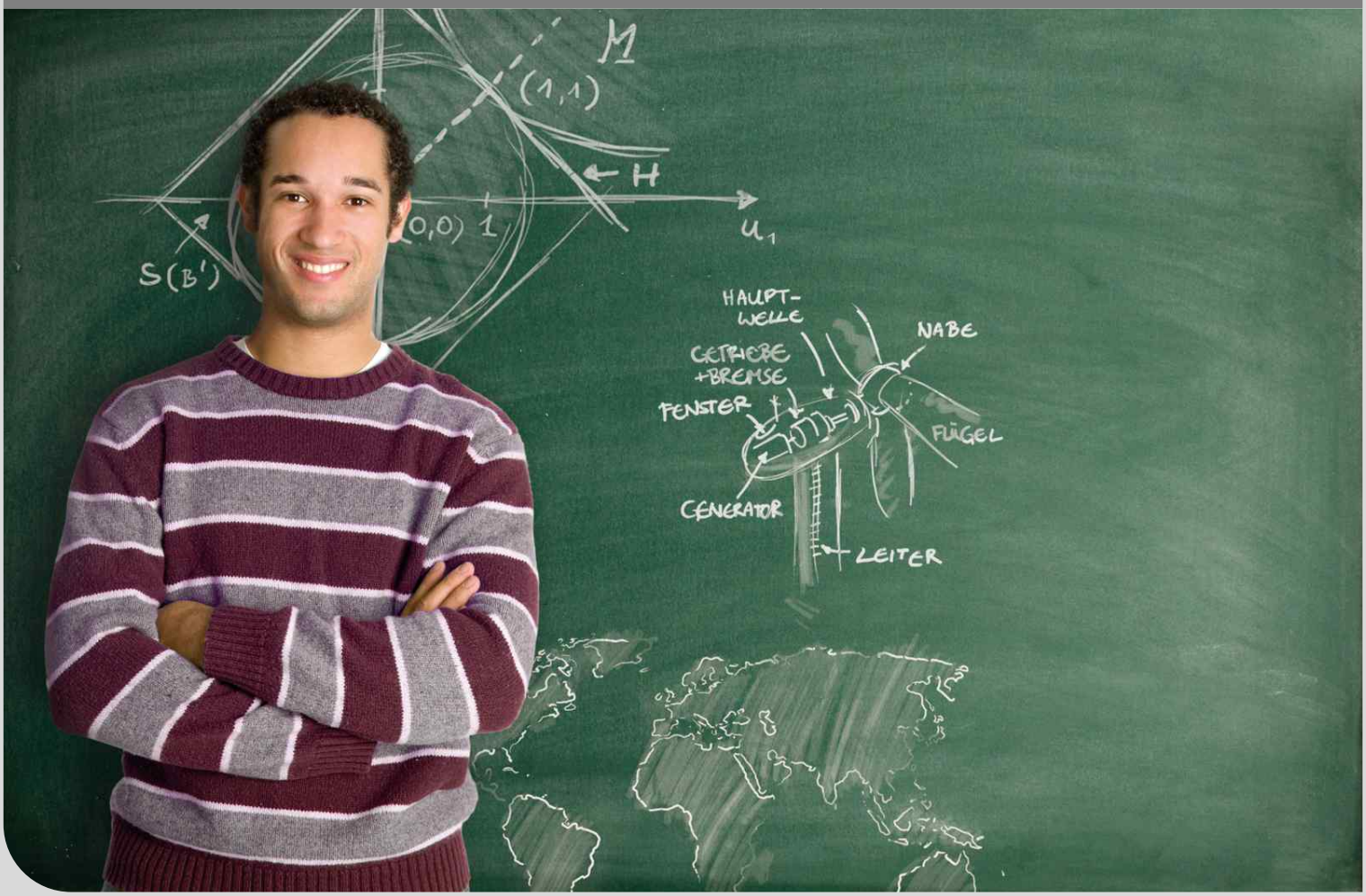
Module Handbook
Economics Engineering B.Sc.

SPO 2015

Summer term 2019

Date: 08.04.2019

KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT



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1 Welcome to the new module handbook of your study programme

We are delighted that you have decided to study at the KIT Department of Economics and Management and wish you a good start into the new semester!

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

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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 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.

2.1.7 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.

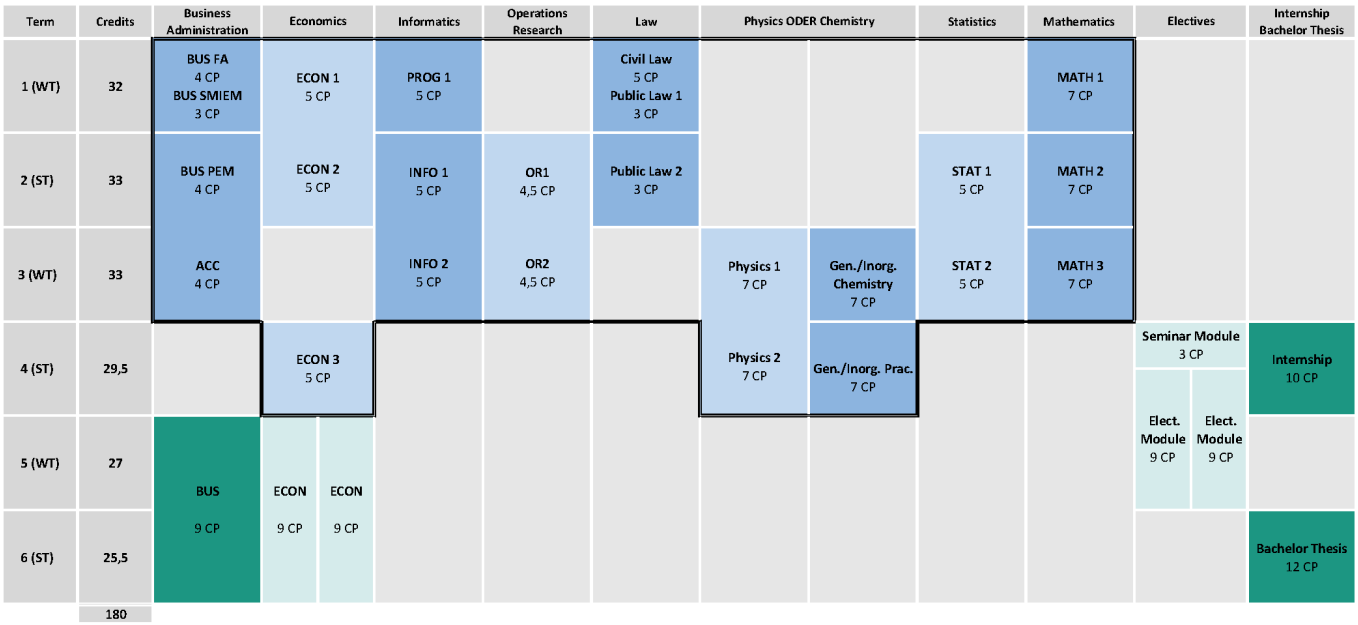

Figure 2: Structure of the Bachelor's degree program in Engineering Economics SPO2015 (recommended)

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

Election notes
The modules in the specialization programme can only be started if the corresponding basic modules have been completed beforehand. On application, the examination office may grant permission to take part in examinations for specialization modules, even if the subject-related fundamentals, i.e. the subject-related modules of the basic programme, have not yet been successfully proven. Information on the procedure can be found at https://www.wiwi.kit.edu/ps_ankuendigung.php?aktid=278.

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	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	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	9 CR

4.5 Economics

Credits
33

Election notes
The modules in the specialization programme can only be started if the corresponding basic modules have been completed beforehand. On application, the examination office may grant permission to take part in examinations for specialization modules, even if the subject-related fundamentals, i.e. the subject-related modules of the basic programme, have not yet been successfully proven. Information on the procedure can be found at https://www.wiwi.kit.edu/ps_ankuendigung.php?aktid=278.

Mandatory		
M-WIWI-101606	Economics	15 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-101668	Economic Policy I	9 CR
M-WIWI-101501	Economic Theory	9 CR

4.6 Informatics

Credits
15

Election notes
The module in the specialization programme can only be started if the corresponding basic modules have been completed beforehand. On application, the examination office may grant permission to take part in examinations for specialization modules, even if the subject-related fundamentals, i.e. the subject-related modules of the basic programme, have not yet been successfully proven. Information on the procedure can be found at https://www.wiwi.kit.edu/ps_ankuendigung.php?aktid=278.

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

4.7 Operations Research

Credits
9

Election notes
The modules in the specialization programme can only be started if the corresponding basic modules have been completed beforehand. On application, the examination office may grant permission to take part in examinations for specialization modules, even if the subject-related fundamentals, i.e. the subject-related modules of the basic programme, have not yet been successfully proven. Information on the procedure can be found at https://www.wiwi.kit.edu/ps_ankuendigung.php?aktid=278.

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-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	9 CR
M-WIWI-101434	eBusiness and Service Management	9 CR
M-WIWI-101402	eFinance	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	9 CR
Election block: Informatik (at most 18 credits)		
M-WIWI-101399	Emphasis Informatics	9 CR
M-WIWI-101426	Electives in Informatics	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-MACH-101269	Introduction to Technical Logistics	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-101287	Microsystem Technology	9 CR
M-BGU-101067	Mobility and Infrastructure	9 CR
M-MACH-101270	Product Lifecycle Management	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	Level	Version
9	Each term	1 semester	3	8

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	5 CR	Rebennack

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

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

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

Competence Goal
The student

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

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

Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101418 - Introduction to Operations Research must have been passed.

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 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	Deutsch	3	2

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

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101606 - Economics must have been passed.

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 5.3 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	2

Mandatory			
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 5.4 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	1

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
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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-MACH-101275 - Combustion Engines I must have been started.

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 5.5 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	Deutsch	3	2

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

M 5.6 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	Deutsch	3	1

Mandatory			
T-INFO-101963	Public Law I - Basic Principles	3 CR	Marsch
T-INFO-102042	Public Law II	3 CR	Marsch

Workload
See German version.

M 5.7 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)
Compulsory Elective Modules (Betriebswirtschaftslehre)

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

Election block: Wahlpflichtangebot (2 items)			
T-WIWI-102596	Analytical CRM	4,5 CR	Geyer-Schulz
T-WIWI-102597	Operative CRM	4,5 CR	Geyer-Schulz
T-WIWI-102595	Customer Relationship Management	4,5 CR	Geyer-Schulz

Competence Certificate
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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)

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

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

Content
Sustainable design, construction and operation of buildings currently are predominant topics of the real estate sector, as well as "green buildings". Not only designers and civil engineers, but also other actors who are concerned with project development, financing and insurance of buildings or portfolio management are interested in these topics.
On the one hand the courses included in this module cover the basics of energy-efficient, resource-saving and health-supporting design and construction of buildings. On the other hand fundamental assessment procedures for analysing and communicating the ecological advantageousness of technical solutions are discussed. With the basics of green building certification systems the lectures provide presently strongly demanded knowledge.

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

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

Furthermore a combination with courses in the area of

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

is recommended.

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

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

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

Credits	Language	Level	Version
9	Deutsch	3	7

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109938	Digital Services	4,5 CR	
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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

Responsible: 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	2

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
Successful passing of the corresponding modules of the basic program.
For further information see German version.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101606 - Economics must have been passed.

Recommendation
None

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

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

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

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

Credits	Recurrence	Language	Level	Version
9	Each term	Deutsch	3	7

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-103213	Basic Principles of Economic Policy	4,5 CR	Ott
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 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
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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101606 - Economics must have been passed.

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 expenditure of time for 9 credits: 270 hours.

Attendance time per lecture: 3x14h

Preparation and wrap-up time per lecture: 3x14h

Rest: Exam Preparation

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

M 5.12 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	Level	Version
9	Each term	2 semester	3	2

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The following conditions have to be fulfilled:
2. The module M-WIWI-101606 - Economics must have been passed.

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

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

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

Recommendation
None

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

M 5.13 Module: Economics [M-WIWI-101606]

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

Credits	Language	Level	Version
15	Deutsch	3	1

Mandatory			
T-WIWI-102708	Economics I: Microeconomics	5 CR	Puppe, Reiß
T-WIWI-102709	Economics II: Macroeconomics	5 CR	Wigger
T-WIWI-102736	Economics III: Introduction in Econometrics	5 CR	Schienle

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.

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].

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 450 hours. For further information see German version.

M 5.14 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	Level	Version
9	Each term	2 semester	3	5

Mandatory			
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
Election block: Ergänzungsangebot (4,5 credits)			
T-WIWI-102625	Exchanges	1,5 CR	Franke
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
Successful passing of the corresponding modules of the basic program.

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

Organisation: KIT Department of Economics and Management

Part of: Compulsory Elective Modules (Informatik)

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

Election block: Wahlplfichtangebot (between 9 and 10 credits)			
T-WIWI-109263	Applications of Artificial Intelligence	5 CR	Sure-Vetter
T-WIWI-102652	Applied Informatics I - Modelling	5 CR	Oberweis, Sure-Vetter
T-WIWI-109445	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	5 CR	Sunyaev
T-WIWI-102660	Database Systems	5 CR	Oberweis
T-WIWI-108716	Interdisciplinary Approach to Verifiable e-Voting	4 CR	Volkamer
T-WIWI-104679	Foundations of Mobile Business	5 CR	Oberweis, Schiefer
T-WIWI-108387	Information Security	5 CR	Volkamer
T-WIWI-100809	Software Engineering	4 CR	Oberweis
T-WIWI-102910	Special Topics of Applied Informatics	5 CR	Oberweis, Sack, Sunyaev, Sure-Vetter, Volkamer, Zöllner
T-WIWI-110108	Visual Computing	5 CR	Landesberger von Antburg

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101417 - Foundations of Informatics must have been passed.
2. The module M-WIWI-101581 - Introduction to Programming must have been passed.

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

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

M 5.16 Module: Emphasis Informatics [M-WIWI-101399]

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	9

Election block: Wahlpflichtangebot (5 credits)			
T-WIWI-102747	Advanced Programming - Java Network Programming	5 CR	Ratz
T-WIWI-102748	Advanced Programming - Application of Business Software	5 CR	Klink, Oberweis
Election block: Ergänzungsangebot (between 4 and 5 credits)			
T-WIWI-102652	Applied Informatics I - Modelling	5 CR	Oberweis, Sure-Vetter
T-WIWI-109445	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	5 CR	Sunyaev
T-WIWI-109263	Applications of Artificial Intelligence	5 CR	Sure-Vetter
T-WIWI-102660	Database Systems	5 CR	Oberweis
T-WIWI-108716	Interdisciplinary Approach to Verifiable e-Voting	4 CR	Volkamer
T-WIWI-104679	Foundations of Mobile Business	5 CR	Oberweis, Schiefer
T-WIWI-108387	Information Security	5 CR	Volkamer
T-WIWI-100809	Software Engineering	4 CR	Oberweis
T-WIWI-102910	Special Topics of Applied Informatics	5 CR	Oberweis, Sack, Sunyaev, Sure-Vetter, Volkamer, Zöllner
T-WIWI-110108	Visual Computing	5 CR	Landesberger von Antburg

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,
- is familiar with methods and systems of a core topic or core application area 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
Successful passing of the corresponding modules of the basic program (except*Advanced Programming - Java Network Programming*and *Advanced Programming - Application of Business Software).*

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 5.17 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	Level	Version
9	Each term	1 semester	3	2

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

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
Successful passing of the corresponding modules of the basic program.
The lecture *Introduction into Energy Economics* [2581010] has to be examined.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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

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

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

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

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

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

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

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

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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

Responsible: Prof. Dr. Thomas Schimmel
Organisation: KIT Department of Physics
Part of: Physics or Chemistry

Credits	Recurrence	Language	Level	Version
14	Each winter term	Deutsch	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
none

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

Responsible: Prüfungsausschuss der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Economics and Management
Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Level	Version
9	Once	3	3

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
See German version.

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

Responsible: Dr. rer. nat. Pradyumn Kumar Shukla
Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: Informatics

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

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

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

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

- Foundations of Informatics I: Written exam in the first week of the recess period (60 min)
- Foundations of Informatics II: Written exam in the first week of the recess period (90 min). It is possible to gain 0,3-0.4 additional grading points for a passed exam by successful completion of a bonus exam.

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

Competence Goal
The student

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

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

Prerequisites
None

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

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

Workload
The total workload for this module is approximately 300 hours.

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

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

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

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
Successful passing of the corresponding modules of the basic program.

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration (mandatory)

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

Mandatory			
T-WIWI-102817	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 5.24 Module: Fundamentals of Business Administration 2 [M-WIWI-101578]

Responsible: Prof. Dr. Martin Ruckes
Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: Business Administration (mandatory)

Credits	Language	Level	Version
8	Deutsch	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 5.25 Module: Fundamentals of Construction [M-BGU-101004]

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

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

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
none

Recommendation
None

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

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

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration (Vertiefungsprogramm Betriebswirtschaftslehre)
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	3	4

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109938	Digital Services	4,5 CR	
T-WIWI-109816	Foundations of Interactive Systems	4,5 CR	Mädche
T-WIWI-105711	Practical Seminar Digital Services	4,5 CR	Fichtner, Mädche, Nickel, Satzger, Sure-Vetter, 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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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 5.27 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	Deutsch	3	1

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

Prerequisites
none

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-PHYS-100283 - Experimental Physics must not have been started.

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

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

Credits	Recurrence	Level	Version
9	Each term	3	3

Mandatory			
T-WIWI-102909	Human Resource Management	4,5 CR	Nieken
Election block: Ergänzungsangebot (between 4,5 and 5,5 credits)			
T-WIWI-102908	Personnel Policies and Labor Market Institutions	4,5 CR	Nieken
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
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
Successful passing of the corresponding modules of the basic program.
The course Personalmanagement (Human Resource Management) is compulsory and must be examined.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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

Recommendation
Completion of module Business Administration is recommended.
Basic knowledge of microeconomics, game theory and statistics is recommended.

Workload
The total workload for this module is approximately 270 hours.

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

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

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

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

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
Successful passing of the corresponding modules of the basic program.

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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

M 5.30 Module: Information Systems & 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	Deutsch	3	2

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.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

M 5.31 Module: Information Systems & 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	Deutsch	3	2

Election block: Wahlpflichtangebot ()			
T-WIWI-109938	Digital Services	4,5 CR	
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.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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	Deutsch	3	1

Election block: Wahlpflichtangebot ()			
T-WIWI-109938	Digital Services	4,5 CR	
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.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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

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

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

Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

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

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 5.34 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	Deutsch	3	2

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 issues of Internet law	3 CR	Dreier

Competence Certificate
The module has been cancelled in summer term 2017.

Prerequisites
None

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

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

Credits	Recurrence	Language	Level	Version
10	Once	Deutsch	3	1

Mandatory			
T-WIWI-102756	Internship	10 CR	Ruckes

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 5.36 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	Deutsch	3	2

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

M 5.37 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	Deutsch	3	1

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	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-103117	Geological Hazards and Risks for external students	4 CR	Gottschämmer
T-BGU-101693	Hydrology	4 CR	Zehe
T-PHYS-101092	Climatology	5 CR	Ginete Werner Pinto
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 5.38 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	Level	Version
9	Each summer term	2 semester	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 5.39 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	Deutsch	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 5.40 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	Level	Version
10	Each term	2 semester	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 5.41 Module: Introduction to Technical Logistics [M-MACH-101269]

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

Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	3

Election block: Einführung in die Technische Logistik (Kernbereich) (between 1 and 2 items as well as 6 credits)			
T-MACH-102151	Material Flow in Logistic Systems	6 CR	Furmans
T-MACH-102163	Basics of Technical Logistics	6 CR	Mittwollen, Oellerich
Election block: Einführung in die Technische Logistik (Ergänzungsbereich) (1 item as well as at least 3 credits)			
T-MACH-102128	Information Systems and Supply Chain Management	3 CR	Kilger
T-MACH-102160	Selected Applications of Technical Logistics	4 CR	Milushev, Mittwollen
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105151	Energy Efficient Intralogistic Systems	4 CR	Braun, Schönung
T-MACH-105165	Automotive Logistics	4 CR	Furmans
T-MACH-105175	Airport Logistics	3 CR	Richter
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch
T-MACH-102159	Elements and Systems of Technical Logistics	4 CR	Fischer, Mittwollen
T-MACH-108946	Elements and Systems of Technical Logistics - Project	2 CR	Fischer, Mittwollen
T-MACH-108945	Selected Applications of Technical Logistics - Project	2 CR	Milushev, Mittwollen

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 aquires

- well-founded knowledge and method knowledge in the main topics of technical logistics,
- expertise and understanding about the functionality of conveyor technology,
- ability for modeling logistic systems with adequate accuracy by using simple models,
- ability to evaluate logistic systems and to identify cause-and-effects-chains within logistic systems.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Content
The module *Introduction to Technical Logistics* provides first insights into main topics of technical logistics. Within the lectures, the interaction between several components of material handling systems will be clarified. The focus will be on technical characteristics of material handling technology and basics for sizing of material handling systems. To gain a deeper understanding, the course is accompanied by exercises and further improved by case studies.

Workload
270 hours

Learning type
Lecture, tutorial.

M 5.42 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	Deutsch	3	1

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

Prerequisites
none

M 5.43 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	Deutsch	4	2

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 5.44 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	Level	Version
9	Each term	2 semester	3	1

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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 5.45 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	Deutsch	3	3

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 5.46 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	Deutsch	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 5.47 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	Deutsch	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 5.48 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	Deutsch	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 5.49 Module: Mechanical Design [M-MACH-101299]

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
8	Deutsch	3	2

Mandatory			
T-MACH-104739	Mechanical Design I and II - CIW	6 CR	Matthiesen
T-MACH-102132	Mechanical Design I, Tutorial	1 CR	Matthiesen
T-MACH-102133	Mechanical Design II, Tutorial	1 CR	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
Successful passing of the corresponding modules of the basic program.

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: 34,5hMKL1:
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 5.50 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	8

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.

Successful passing of the corresponding modules of the basic program.

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 5.51 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	Deutsch	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 5.52 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	Deutsch	3	1

Mandatory			
T-BGU-101791	Mobility and Infrastructure	9 CR	Roos, Vortisch

Prerequisites
none

Recommendation
None

Annotation
None

M 5.53 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	Deutsch	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.

Modeled Conditions
The following conditions have to be fulfilled:

1. You need to earn at least 120 credits in the following fields:
    - Internship
    - Business Administration
    - Informatics
    - Mathematics
    - Operations Research
    - Physics or Chemistry
    - Law
    - Statistics
    - Economics
    - Compulsory Elective Modules
2. The module **M-WIWI-101494 - Fundamentals of Business Administration 1** must have been passed.
3. The module **M-WIWI-101578 - Fundamentals of Business Administration 2** must have been passed.
4. The module **M-WIWI-101606 - Economics** must have been passed.

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 5.54 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	Level	Version
9	Each term	1 semester	3	3

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	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.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101418 - Introduction to Operations Research must have been passed.

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 5.55 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	Deutsch	3	1

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

M 5.56 Module: Preliminary Exam [M-WIWI-101726]

Organisation: University
Part of: Preliminary Exam

Credits	Language	Level	Version
0	Deutsch	3	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
none

M 5.57 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	Deutsch	3	2

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-101316	Law of Contracts	3 CR	Dreier
T-INFO-101314	Tax Law II	3 CR	Dietrich, Dreier
T-INFO-101315	Tax Law I	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 5.58 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	Level	Version
9	Each term	1 semester	4	2

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	Ovtcharova
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
Successful passing of the corresponding modules of the basic program.

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 5.59 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	Deutsch	3	2

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
The module has been cancelled in summer term 2017.

M 5.60 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	Level	Version
9	Each term	1 semester	3	4

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.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101606 - Economics must have been passed.

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 5.61 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	Level	Version
9	Each term	2 semester	3	1

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
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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 5.62 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	Deutsch	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 5.63 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	Deutsch	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 5.64 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)
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	3	3

Election block: Wahlpflichtangebot (between 1 and 2 items)			
T-WIWI-102596	Analytical CRM	4,5 CR	Geyer-Schulz
T-WIWI-102597	Operative CRM	4,5 CR	Geyer-Schulz
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-109938	Digital Services	4,5 CR	
T-WIWI-100005	Competition in Networks	4,5 CR	Mitusch

Competence Certificate
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
Successful passing of the corresponding modules of the basic program.

- 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.
- At least, one of the courses *Analytic CRM* [2540522] and *Operative CRM* [2540520] has to be taken.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101460 - CRM and Service Management must have been started.
2. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
3. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been 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 5.65 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	Deutsch	4	2

Election block: Vertiefung der Produktionstechnik (at least 9 credits)			
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-105166	Materials and Processes for Body Leightweight Construction in the Automotive Industry	4 CR	Kienzle, Steegmüller
T-MACH-108878	Laboratory Production Metrology	4 CR	Häfner
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
Successful passing of the corresponding modules of the basic program.

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 5.66 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: Compulsory Elective Modules (Statistik)

Credits	Language	Level	Version
9	Deutsch	3	1

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.

Prerequisites
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101432 - Introduction to Statistics must have been passed.

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 5.67 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	Deutsch	3	3

Election block: Strategie und Organisation (at least 9 credits)			
T-WIWI-102629	Management and Strategy	3,5 CR	Lindstädt
T-WIWI-102630	Managing Organizations	3,5 CR	Lindstädt
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 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.

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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 5.68 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	Level	Version
9	Each term	1 semester	3	7

Mandatory			
T-WIWI-107506	Platform Economy	4,5 CR	Straub, Weinhardt
Election block: Ergänzungsangebot (at most 4 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
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 course T-WIWI-107506 "Platform Economy" has to be taken.
Successful passing of the corresponding modules of the basic program.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.

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 5.69 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	Level	Version
9	Each term	1 semester	3	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-108445	Applied Asset Management	3 CR	Sauer
T-WIWI-102625	Exchanges	1,5 CR	Franke
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

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
Successful passing of the corresponding modules of the basic program.

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*.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.
3. The module M-WIWI-101435 - Essentials of Finance must have been started.

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 5.70 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	Level	Version
9	Each term	1 semester	3	6

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-108445	Applied Asset Management	3 CR	Sauer
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

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
Successful passing of the corresponding modules of the basic program.

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*.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101494 - Fundamentals of Business Administration 1 must have been passed.
2. The module M-WIWI-101578 - Fundamentals of Business Administration 2 must have been passed.
3. The module M-WIWI-101435 - Essentials of Finance must have been started.

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 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 - Vertiefung Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2511026	Advanced Programming - Application of Business Software	2 SWS	Lecture (V)	Klink
WS 18/19	2511027	Übungen zu Programmierung kommerzieller Systeme - Einsatz betrieblicher Standard-Software	1 SWS	Practice (Ü)	Klink, Ullrich
WS 18/19	2511028	Rechnerübung zu Programmierung kommerzieller Systeme - Einsatz betrieblicher Standard-Software	2 SWS	Practice (Ü)	Ullrich
Exams					
WS 18/19	7900019	Advanced Programming - Application of Business Software		Prüfung (PR)	
SS 2019	7900049	Advanced Programming - Application of Business Software		Prüfung (PR)	Klink

Competence Certificate
The assessment consists of a written examination of 2 hours (Section 4 (2), 1 of the examination regulations) and of assignments during the course (Section 4 (2), 3 SPO 2007 respectively Section 4 (3) SPO 2015).
Successful participation to the computer lab is precondition for permission to the assessment. Further information will be given at the first lesson and via the homepage of the course.

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 - Java Network Programming*.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102747 - Advanced Programming - Java Network Programming must not have been started.

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 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
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.

Workload
Lecture 30h
Exercise course 17h
Review and preparation of lectures 30h

Review and preparation of exercises 15h

Computer Lab 30h
Exam preparation 29h

Exam 1h

Total 150 h

Exercise courses are done by student tutors (size about 50 students)

Literature

- Schönthaler, Vossen, Oberweis, Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.
- Hasenkamp, Stahlknecht: Einführung in die Wirtschaftsinformatik. Springer 2012.
- Hansen, Neumann: Wirtschaftsinformatik I. Grundlagen betrieblicher Informationsverarbeitung. UTB 2009.
- Mertens et al.: Grundzüge der Wirtschaftsinformatik. Springer 2012.

Further literature will be given during the course.

T 6.2 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 - Vertiefung Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	2

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	Practice (PÜ)	Ratz, Struppek, Ulrich
Exams					
WS 18/19	7900020	Advanced Programming - Java Network Programming		Prüfung (PR)	
SS 2019	7900041	Advanced Programming - Java Network Programming		Prüfung (PR)	Ratz

Competence Certificate
At the end of the lecture period, a written examination (90 min.) (according to§4(2), 1 SPO) will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
This course cannot be taken together with*Advanced Programming - Application of Business Software*[2511026].

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102748 - Advanced Programming - Application of Business Software must not have been started.

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

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

V Advanced Programming - Java Network Programming

2511020, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

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 6.3 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 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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

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, 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 6.4 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	3

Events					
SS 2019	2122300	Agile product innovation management - value-driven planning of new products	SWS	Lecture (V)	Kläger
Exams					
WS 18/19	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 6.5 Course: Airport Logistics [T-MACH-105175]

Responsible: André Richter
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	2

Events					
WS 18/19	2117056	Airport logistics	2 SWS	Lecture (V)	Richter
Exams					
WS 18/19	76-T-MACH-105175	Airport Logistics		Prüfung (PR)	Furmans

Competence Certificate
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

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

V Airport logistics

2117056, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:
presentations

Learning Content
Introduction
airport installations
luggage transport
passenger transport
security on the airport
legal bases of the air traffic
freight on the airport

Annotation
Limited number of participants: allocation of places in sequence of application (first come first served)
Application via "ILIAS" mandatory
personal presence during lectures mandatory

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

Literature
„Gepäcklogistik auf Flughäfen“ à http://www.springer.com/de/book/9783642328527

T 6.6 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 - Soziologie/Empirische Sozialforschung
M-WIWI-104906 - Geistes- und Sozialwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	5011007	Sozialstrukturanalyse	2 SWS	Practice (Ü)	Nollmann
Exams					
WS 18/19	7400029	Analalysis of Social Structurs (WiWi)		Prüfung (PR)	Nollmann

T 6.7 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 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	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

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, 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 6.8 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 - Ökonometrie und VWL
M-WIWI-101599 - Statistik und Ökonometrie
M-WIWI-101608 - Statistik und Ökonometrie
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Exams				
WS 18/19	7900240	Analysis of Multivariate Data	Prüfung (PR)	Grothe

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. The exam is offered every semester. Re-examinations are offered only for repeaters.

Prerequisites
None

Recommendation
Attendance of the courses Statistics 1 [2600008] and Statistics 2 [2610020] is recommended.

Annotation
The lecture is not offered regularly. The courses planned for three years in advance can be found online.

T 6.9 Course: Analysis Tools for Combustion Diagnostics [T-MACH-105167]

Responsible: Jürgen Pfeil
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2134134	Analysis tools for combustion diagnostics	2 SWS	Lecture (V)	Pfeil

Competence Certificate
oral examination, Duration: 25 min., no auxiliary means

Prerequisites
none

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

V Analysis tools for combustion diagnostics

2134134, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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 6.10 Course: Analytical CRM [T-WIWI-102596]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101422 - Vertiefung im Customer Relationship Management
M-WIWI-101460 - CRM und Servicemanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2540522	Analytical CRM	2 SWS	Lecture (V)	Geyer-Schulz
SS 2019	2540523	Übungen zu Analytisches CRM	2 SWS	Practice (Ü)	Schweizer
Exams					
WS 18/19	7979571	Analytical CRM (Nachklausur SS 2018)		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
We expect knowledge about data models and the UML modelling language concerning information systems.

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

V Analytical CRM

2540522, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The course Analytical CRM deals with methods and techniques for analysis concerning the management and improval of customer relationships. Knowledge about customers is aggregated and used for enterprise decision problems like product line planning, customer loyality, etc. A necessary precondition for these analyses is the transformation of data stemming from operative systems into a common data warehouse that assembles all necessary information. This requires transformation of data models and processes for creating and managing a data warehouse, like ETL processes, data quality and monitoring. The generation of customer oriented and flexible reports for different business purposes is covered. The course finally treats several different statistical analysis methods like clustering, regression etc. that are necessary for generating important indicators (like customer lifetime value, customer segmenatation). As external data source, customer surveys are introduced.

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
Ponnia, Paulraj. Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals. Wiley, New York, 2001.

Duda, Richard O. und Hart, Peter E. und Stork, David G. Pattern Classification. Wiley-Interscience, New York, 2. Ausgabe, 2001.

Maddala, G. S. Introduction to Econometrics. Wiley, Chichester, 3rd Ed., 2001.

Theil, H. Principles of Econometrics. Wiley, New York, 1971.

T 6.11 Course: Applications of Artificial Intelligence [T-WIWI-109263]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2511314	Applications of Artificial Intelligence	2 SWS	Lecture (V)	Sure-Vetter
WS 18/19	2511315	Exercises to Applications of Artificial Intelligence	1 SWS	Practice (Ü)	Sure-Vetter, Weller
Exams					
WS 18/19	7900091	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.

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

Recommendation
Basics in logic, e.g. from lecture Foundations of Informatics 1 are important.

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

V Applications of Artificial Intelligence

2511314, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
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.

Learning Content
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.

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

V Exercises to Applications of Artificial Intelligence

2511315, WS 18/19, 1 SWS, Open in study portal

Practice (Ü)

Description
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.

Learning Content
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.

Workload
The total workload for the lecture Anwendungen der KI is given out on the description of the lecture.

T 6.12 Course: Applied Asset Management [T-WIWI-108445]

Responsible: Dr. Andreas Sauer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	2

Events					
WS 18/19	2530219	Applied Asset Management	2 SWS	Lecture (V)	Sauer
Exams					
WS 18/19	7900061	Applied Asset Management		Prüfung (PR)	Sauer, Ruckes

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
T-WIWI-102879 "Asset Management" must not be selected.

Recommendation
Proficiency of the topics covered in the course “Investments” is required.

Annotation
Former title of the course until winter term 2017/2018: "Asset Management"

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

V Applied Asset Management
2530219, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The course familiarizes students with the instruments, methods and terms of professional asset management. It conveys the knowledge of applying the relevant methods to students via practical exercises.

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

Literature
Investments and Portfolio Management,
Zvi Bodie, Alex Kane, Alan J. Marcus,

Mcgraw-Hill Publ.Comp., 9. Auflage (2011)

The Theory and Practice of Investment Management: Asset Allocation, Valuation, Portfolio Construction, and Strategies

Frank J. Fabozzi, Harry Markowitz

John Wiley & Sons; 2. Auflage (2011)

T 6.13 Course: Applied Informatics I - Modelling [T-WIWI-102652]

Responsible: Prof. Dr. Andreas Oberweis
Prof. Dr. York Sure-Vetter

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	3

Events					
WS 18/19	2511030	Applied Informatics I - Modelling	2 SWS	Lecture (V)	Sure-Vetter, Koschmider, Schiefer, Oberweis
WS 18/19	2511031	Exercises to Applied Informatics I - Modelling	1 SWS	Practice (Ü)	Sure-Vetter, Koschmider, Schiefer, Thoma, Käfer
Exams					
WS 18/19	7900003	Applied Informatics I - Modelling		Prüfung (PR)	Oberweis, Sure-Vetter
SS 2019	7900018	Applied Informatics I - 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

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

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

V Applied Informatics I - Modelling
2511030, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
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.

Learning Content
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.

Workload
Total effort: 120-150 hours

Presence time: 30 hours

Self study: 90-120 hours

Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
- W. Reisig. Petrinetze, Springer-Verlag, 2010.

Additional literature:

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

V Exercises to Applied Informatics I - Modelling

2511031, WS 18/19, 1 SWS, Open in study portal

Practice (Ü)

Description
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.

Learning Content
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.

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

Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.
- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education 2009.
- W. Reisig. Petrinetze, Springer-Verlag, 2010.

Additionalliterature:

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

T 6.14 Course: Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services [T-WIWI-109445]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	2

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					
SS 2019	7900025	Applied Informatics II - Internet Computing		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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

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, 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

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

Literature
Tba in the lecture.

T 6.15 Course: Auction & Mechanism Design [T-WIWI-102876]

Responsible: Prof. Dr. Nora Szech
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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

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, 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 6.16 Course: Automotive Logistics [T-MACH-105165]

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

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	1

Events					
SS 2019	2118085	Automotive Logistics	2 SWS	Lecture (V)	Furmans
Exams					
WS 18/19	76-T-MACH-105165	Automotive Logistics		Prüfung (PR)	Furmans, Mittwollen
SS 2019	76-T-MACH-105165	Automotive Logistics		Prüfung (PR)	Mittwollen, Furmans

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

Prerequisites
none

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

V Automotive Logistics

2118085, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations, black board

Notes
The event will be offered for the last time in the summer semester 2019.

Learning Content

- Logistic questions within the automobile industry
- basic model of automobile production and distribution
- relation with the suppliers
- Disposition and physical execution
- Vehicle production in the interaction of shell, paint shop and assembly
- Sequence planning
- Assembly supply
- vehicle distribution and linkage with selling processes
- Physical execution, planning and control

Annotation
none

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

Literature
None.

T 6.17 Course: Bachelor Thesis [T-WIWI-103096]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101612 - Modul Bachelorarbeit

Type	Credits	Version
Abschlussarbeit	12	1

Competence Certificate
See module description

Prerequisites
See module description

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

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

This thesis requires confirmation by the examination office.

Recommendation
See module description

Annotation
See module description

T 6.18 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 - Wirtschaftspolitik I
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2560280	Basic Principles of Economic Policy	2 SWS	Lecture (V)	Ott
SS 2019	2560281	Übungen zur Einführung in die Wirtschaftspolitik	1 SWS	Practice (Ü)	Ott, Bälz, Scheu
Exams					
WS 18/19	7900079	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].

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

V Basic Principles of Economic Policy

2560280, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning 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

Annotation
The course "Basic Principles of Economic Policy" [2560280] is not offered in summer term 2015.

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

Literature
See announcements to the lecture

T 6.19 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 - Finanzwissenschaft
M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2560134	Basics of German Company Tax Law and Tax Planning	3 SWS	Lecture (V)	Wigger, Gutekunst
Exams					
WS 18/19	790unbe	Basics of German Company Tax Law and Tax Planning		Prüfung (PR)	Wigger
SS 2019	790unbe	Basics of German Company Tax Law and Tax Planning		Prüfung (PR)	Wigger

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

Prerequisites
None

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

T 6.20 Course: Basics of Technical Logistics [T-MACH-102163]

Responsible: Dr.-Ing. Martin Mittwollen
Jan Oellerich

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each winter term	4

Events					
WS 18/19	2117095	Basics of Technical Logistics	4 SWS	Lecture / Practice (VÜ)	Mittwollen, Oellerich
Exams					
WS 18/19	76-T-MACH-102163	Basics of Technical Logistics		Prüfung (PR)	Mittwollen
SS 2019	76-T-MACH-102163	Basics of Technical Logistics		Prüfung (PR)	Mittwollen

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 Basics of Technical Logistics

2117095, WS 18/19, 4 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Description
Media:
supplementary sheets,presentations, blackboard

Notes
lectures and practice; practice dates: look up ILIAS

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 6.21 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	2142883	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II	2 SWS	Lecture (V)	Guber
Exams					
WS 18/19	76-T-MACH-100967	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II		Prüfung (PR)	Guber
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 — Lecture (V)

2142883, SS 2019, 2 SWS, Open in study portal

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 6.22 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	2142879	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III	2 SWS	Lecture (V)	Guber
Exams					
WS 18/19	76-T-MACH-100968	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III		Prüfung (PR)	Guber
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

Lecture (V)

2142879, SS 2019, 2 SWS, Open in study portal

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 6.23 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2142140	Bionics for Engineers and Natural Scientists	2 SWS	Lecture (V)	Hölscher, Walheim, Greiner
Exams					
WS 18/19	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, Open in study portal **Lecture (V)**

Description
Media:

Slides of the lectures

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 6.24 Course: Business Administration: Finance and Accounting [T-WIWI-102819]

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

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101494 - Grundlagen BWL 1
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	1

Events					
WS 18/19	2610026	Business Administration: Finance and Accounting	2 SWS	Lecture (V)	Ruckes, Wouters
WS 18/19	2610027	Tutorien zu Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen	2 SWS	Tutorial (Tu)	Strych
Exams					
WS 18/19	7900245	Business Administration: Finance and Accounting		Prüfung (PR)	Wouters, Ruckes
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 18/19, 2 SWS, 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 6.25 Course: Business Administration: Production Economics and Marketing [T-WIWI-102818]

Responsible: Prof. Dr. Wolf Fichtner
Prof. Dr. Martin Klarmann
Prof. Dr.-Ing. Thomas Lützkendorf
Prof. Dr. Martin Ruckes
Prof. Dr. Frank Schultmann

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101578 - Grundlagen BWL 2
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	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					
WS 18/19	7900207	Business Administration: Production Economics and Marketing		Prüfung (PR)	Fichtner, Klarmann

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, 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 6.26 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 - Grundlagen BWL 1
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2600023	Betriebswirtschaftslehre: Unternehmensführung und Informationswirtschaft	2 SWS	Lecture (V)	Lindstädt, Weinhardt, Strych, Graf
Exams					
WS 18/19	7900246	Business Administration: Strategic Management and Information Engineering and Management		Prüfung (PR)	Lindstädt, Weinhardt
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 6.27 Course: Business Strategies of Banks [T-WIWI-102626]

Responsible: Prof. Dr. Wolfgang Müller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101423 - Topics in Finance II
M-WIWI-101465 - Topics in Finance I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2530299	Business Strategies of Banks	2 SWS	Lecture (V)	Müller
Exams					
WS 18/19	7900064	Business Strategies of Banks		Prüfung (PR)	Müller, Ruckes
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 18/19, 2 SWS, 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 6.28 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung praktisch	2	Each term	2

Events					
WS 18/19	2123357	CAD-NX training course	2 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
SS 2019	2123357	CAD-NX training course	3 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	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, WS 18/19, 2 SWS, 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

2123357, SS 2019, 3 SWS, 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

T 6.29 Course: Civil Law for Beginners [T-INFO-103339]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101187 - Recht Wahlpflicht
M-INFO-101190 - Einführung in das Privatrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	2

Events					
WS 18/19	24012	Civil Law for Beginners	4 SWS	Lecture (V)	Matz
Exams					
WS 18/19	7500012	Civil Law for Beginners		Prüfung (PR)	Matz, Dreier
SS 2019	7500041	Civil Law for Beginners		Prüfung (PR)	Dreier, Matz

T 6.30 Course: Climatology [T-PHYS-101092]

Responsible: Prof. Dr. Joaquim José Ginete Werner Pinto
Organisation: KIT Department of Physics
Part of: M-WIWI-101646 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104904 - Physik

Type	Credits	Recurrence	Version
Studienleistung	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

Prerequisites
none

T 6.31 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 - Verbrennungsmotoren I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	5	Each winter term	1

Events					
WS 18/19	2133113	Combustion Engines I	4 SWS	Lecture / Practice (VÜ)	Koch
Exams					
WS 18/19	76-T-MACH-102194	Combustion Engines I		Prüfung (PR)	Kubach, Koch
SS 2019	76-T-MACH-102194	Combustion Engines I		Prüfung (PR)	Koch, Kubach

Competence Certificate
oral examination, Duration: 25 min., no auxiliary means

Prerequisites
none

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

V Combustion Engines I

2133113, WS 18/19, 4 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content
Introduction, History, Concepts
Working Principle and Termodynamics
Characteristic Parameters
Air Path
Fuel Path
Energy Conversion
Fuels
Emissions
Exhaust Gas Aftertreatment

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

T 6.32 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 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	5	Each summer term	1

Events					
SS 2019	2134151	Combustion Engines II	3 SWS	Lecture / Practice (VÜ)	Koch
Exams					
WS 18/19	76-T-MACH-104609	Combustion Engines II		Prüfung (PR)	Kubach, Koch
SS 2019	76-T-MACH-104609	Combustion Engines II		Prüfung (PR)	Koch, Kubach

Competence Certificate
oral examination, duration: 25 minutes, no auxiliary means

Prerequisites
none

Recommendation
Fundamentals of Combustion Engines I helpful

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

V Combustion Engines II

2134151, SS 2019, 3 SWS, 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 6.33 Course: Competition in Networks [T-WIWI-100005]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101422 - Vertiefung im Customer Relationship Management
M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-101668 - Wirtschaftspolitik I
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	2

Events					
WS 18/19	2561204	Competition in Networks	2 SWS	Lecture (V)	Mitusch
WS 18/19	2561205	Übung zu Wettbewerb in Netzen	1 SWS	Practice (Ü)	Wisotzky
Exams					
WS 18/19	7900268	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 18/19, 2 SWS, 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 6.34 Course: Computer Contract Law [T-INFO-102036]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	2411604	Computer Contract Law	2 SWS	Lecture (V)	Bartsch, Harnischmacher
Exams					
WS 18/19	7500065	Computer Contract Law		Prüfung (PR)	Dreier, Matz
SS 2019	7500066	Computer Contract Law		Prüfung (PR)	Dreier, Matz

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

V Computer Contract Law

2411604, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
The course deals with contracts from the following areas:

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

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

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

Literature

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

Elective Literature

tba in the transparencies

T 6.35 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 - Grundlagen des Baubetriebs
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	8230101691	Construction Technology		Prüfung (PR)	Haghsheno, Gentes, Schneider

Competence Certificate
written exam with 90 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 6.36 Course: Control Technology [T-MACH-105185]

Responsible: Christoph Gönnheimer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	2

Events					
SS 2019	2150683	Control Technology	2 SWS	Lecture (V)	Gönnheimer
Exams					
WS 18/19	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, Open in study portal — **Lecture (V)**

Description
Media:

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

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 6.37 Course: Copyright [T-INFO-101308]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	24121	Copyright	2 SWS	Lecture (V)	Dreier
Exams					
WS 18/19	7500064	Copyright		Prüfung (PR)	Dreier, Matz
SS 2019	7500064	Copyright		Prüfung (PR)	Dreier, Matz

T 6.38 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 und Servicemanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2540508	Customer Relationship Management	2 SWS	Lecture (V)	Geyer-Schulz
WS 18/19	2540509	Übung zu Customer Relationship Management	1 SWS	Practice (Ü)	Schweigert
Exams					
WS 18/19	7979242	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 18/19, 2 SWS, 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 6.39 Course: Data Mining and Applications [T-WIWI-103066]

Responsible: Rheza Nakhaeizadeh
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101599 - Statistik und Ökonometrie
M-WIWI-101608 - Statistik und Ökonometrie
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	Each summer term	2

Events					
SS 2019	2520375	Data Mining and Applications	2/4 SWS	Lecture (V)	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

2520375, SS 2019, 2/4 SWS, Open in study portal **Lecture (V)**

Learning Content
Part one: Data Mining

Why Data Mining?

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

Part two: Examples of application of Data Mining

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

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

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

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

T 6.40 Course: Data Protection Law [T-INFO-101303]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101217 - Öffentliches Wirtschaftsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	24018	Datenschutzrecht	2 SWS	Lecture (V)	Marsch
Exams					
WS 18/19	7500162	Data Protection Law		Prüfung (PR)	Marsch
SS 2019	7500083	Data Protection Law		Prüfung (PR)	Marsch

T 6.41 Course: Database Systems [T-WIWI-102660]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	2

Events					
SS 2019	2511200	Database Systems	2 SWS	Lecture (V)	Sommer
SS 2019	2511201	Übungen zu Datenbanksysteme	1 SWS	Practice (Ü)	Sommer
Exams					
WS 18/19	7900006	Database Systems		Prüfung (PR)	Oberweis
SS 2019	7900037	Database Systems		Prüfung (PR)	Oberweis

Competence Certificate
The assessment consists of an 1h written exam in the first week after lecture period.

Prerequisites
None

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

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

V Database Systems

2511200, SS 2019, 2 SWS, 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 6.42 Course: Decision Theory [T-WIWI-102792]

Responsible: Prof. Dr. Karl-Martin Ehrhart
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101420 - Ökonometrie und VWL
M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2520365	Decision Theory	2 SWS	Lecture (V)	Ehrhart
SS 2019	2520366	Übungen zu Entscheidungstheorie	1 SWS	Practice (Ü)	Ehrhart
Exams					
WS 18/19	7900223	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, 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 6.43 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	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					
WS 18/19	7900051	Derivatives		Prüfung (PR)	Uhrig-Homburg

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

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

V Derivatives
2530550, SS 2019, 2 SWS, 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 6.44 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 - Bauökologie
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2586404	Design and Construction of Buildings	2 SWS	Lecture (V)	Ströbele, Lützkendorf
WS 18/19	2586405	Übung zu Bauökologie I	1 SWS	Practice (Ü)	Ströbele
Exams					
WS 18/19	7900247	Design, Construction and Sustainability Assessment of Buildings I		Prüfung (PR)	Lützkendorf
WS 18/19	7900248	Design, Construction and Sustainability Assessment of Buildings I		Prüfung (PR)	Lützkendorf

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

Prerequisites
None

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

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

V Design and Construction of Buildings

2586404, WS 18/19, 2 SWS, 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 6.45 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 - Bauökologie
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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

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, 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 6.46 Course: Digital Services [T-WIWI-109938]

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101422 - Vertiefung im Customer Relationship Management
M-WIWI-101434 - eBusiness und Service Management
M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-104900 - Betriebswirtschaftslehre
M-WIWI-104912 - Information Systems & Digital Business: Platforms
M-WIWI-104913 - Information Systems & Digital Business: Servitization

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	3

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-105771 - Foundations of Digital Services A must not have been started.

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".

T 6.47 Course: Economics and Behavior [T-WIWI-102892]

Responsible: Prof. Dr. Nora Szech
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2560137	Economics and Behavior	2 SWS	Lecture (V)	Szech
WS 18/19	2560138	Übung zu Economics and Behavior	1 SWS	Practice (Ü)	Szech
Exams					
WS 18/19	7900134	Exam Economics and Behavior		Prüfung (PR)	Szech
WS 18/19	7900135	Exam Economics and Behavior (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.

The grade will be determined in a final written exam. Students can earn a bonus to the final grade by successfully participating in the exercises.

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 18/19, 2 SWS, 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 6.48 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 - Einführung in die Volkswirtschaftslehre
M-WIWI-101726 - Orientierungsprüfung
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2610012	Economics I: Microeconomics	3 SWS	Lecture (V)	Reiß
Exams					
WS 18/19	791vwl1	Economics I: Microeconomics		Prüfung (PR)	Reiß
WS 18/19	792vwl1	Economics I: Microeconomics		Prüfung (PR)	Reiß

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. 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 18/19, 3 SWS, 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.

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

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

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 6.49 Course: Economics II: Macroeconomics [T-WIWI-102709]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101606 - Einführung in die Volkswirtschaftslehre
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2560015	Economics II : Macroeconomics, Tutorial	SWS	Tutorial (Tu)	Wigger, Zimmermann
SS 2019	2600014	Economics II: Macroeconomics	4 SWS	Lecture (V)	Wigger
Exams					
WS 18/19	7900197	Economics II: Macroeconomics		Prüfung (PR)	Ott

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, 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 6.50 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 - Angewandte Mikroökonomik
M-WIWI-101599 - Statistik und Ökonometrie
M-WIWI-101606 - Einführung in die Volkswirtschaftslehre
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	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

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, 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 6.51 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 und Service Management
M-WIWI-101465 - Topics in Finance I
M-WIWI-104900 - Betriebswirtschaftslehre
M-WIWI-104912 - Information Systems & Digital Business: Platforms

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2540454	eFinance: Information Systems for Securities Trading	2 SWS	Lecture (V)	Weinhardt, Notheisen, Glaser
WS 18/19	2540455	Übungen zu eFinance: Wirtschaftsinformatik für den Wertpapierhandel	1 SWS	Practice (Ü)	Notheisen, Glaser

Competence Certificate
The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations) and by submitting written essays as part of the exercise (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015). 70% of the final grade is based on the written exam and 30% is based on assignments from the exercises. The points obtained in the exercises only apply to the first and second exam of the semester in which they were obtained.

Prerequisites
see below

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102600 - eFinance: Information Engineering and Management for Securities Trading must not have been started.

Recommendation
None

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

V eFinance: Information Systems for Securities Trading

2540454, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

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

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

Literature

- Picot, Arnold, Christine Bortenlänger, Heiner 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 6.52 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 - Elektrische Energienetze
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7307391	Electric Energy Systems		Prüfung (PR)	Leibfried
SS 2019	7307391	Electric Energy Systems		Prüfung (PR)	Leibfried

Prerequisites
none

T 6.53 Course: Elements and Systems of Technical Logistics [T-MACH-102159]

Responsible: Georg Fischer
Dr.-Ing. Martin Mittwollen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2117096	Elements and systems of Technical Logistics	3 SWS	Lecture / Practice (VÜ)	Mittwollen, Fischer
Exams					
WS 18/19	76-T-MACH-102159	Elements and Systems of Technical Logistics		Prüfung (PR)	Mittwollen
SS 2019	76-T-MACH-102159	Elements and Systems of Technical Logistics		Prüfung (PR)	Mittwollen

Competence Certificate
The assessment consists of an oral exam (20min) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

Recommendation
Knowledge out of Basics of Technical Logistics (T-MACH-102163) preconditioned

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

V Elements and systems of Technical Logistics

2117096, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content

- material flow systems and their (conveying) technical components
- mechanical behaviour of conveyors;
- structure and function of conveyor machines; elements of intralogistics (belt conveyor, racks, automatic guided vehicles, fan-in, bifurcation, and etc.)
- sample applications and calculations in addition to the lectures inside practical lectures

Annotation
Knowledge out of **Basics of Technical Logistics** preconditioned

Workload
presence: 36h

rework: 84h

Literature
recommendations during lectures

T 6.54 Course: Elements and Systems of Technical Logistics - Project [T-MACH-108946]

Responsible: Georg Fischer
Dr.-Ing. Martin Mittwollen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	2	Each winter term	1

Events					
WS 18/19	2117097	Elements and systems of Technical Logistics - project	SWS	Project (PRO)	Mittwollen, Fischer
Exams					
WS 18/19	76-T-MACH-108946	Elements and Systems of Technical Logistics - Project		Prüfung (PR)	Mittwollen

Competence Certificate
Presentation of performed project and defense (30min) according to §4 (2), No. 3 of the examination regulation

Prerequisites
T-MACH-102159 (Elements and Systems of Technical Logistics) must have been started

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102159 - Elements and Systems of Technical Logistics must have been started.

Recommendation
Knowledge out of Basics of Technical Logistics (T-MACH-102163) preconditioned

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

V Elements and systems of Technical Logistics - project

2117097, WS 18/19, SWS, Open in study portal — **Project (PRO)**

Description
Media:
supplementary sheets,presentations, blackboard

Learning Content

- mechanical behaviour of conveyors;
- structure and function of conveyor machines;
- elements of intralogistics (belt conveyor, racks, automatic guided vehicles, fan-in, bifurcation, and etc.)
- sample applications and calculations in addition to the lectures inside practical lectures
- Self manufacturing of a project report to recesses the topic.

Annotation
Knowledge out of **Basics of Technical Logistics (LV 2117095)** preconditioned

T 6.55 Course: Employment Law I [T-INFO-101329]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101216 - Recht der Wirtschaftsunternehmen
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	24167	Employment Law I	2 SWS	Lecture (V)	Hoff
Exams					
WS 18/19	7500040	Employment Law I		Prüfung (PR)	Dreier, Matz
SS 2019	7500097	Employment Law I		Prüfung (PR)	Dreier, Matz

T 6.56 Course: Employment Law II [T-INFO-101330]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101216 - Recht der Wirtschaftsunternehmen
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
SS 2019	24668	Employment Law II	2 SWS	Lecture (V)	Hoff
Exams					
WS 18/19	7500058	Employment Law II		Prüfung (PR)	Dreier, Matz
SS 2019	7500098	Employment Law II		Prüfung (PR)	Dreier, Matz

T 6.57 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 - Verbrennungsmotoren I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2133121	Energy Conversion and Increased Efficiency in Internal Combustion Engines	2 SWS	Lecture (V)	Koch
Exams					
WS 18/19	76-T-MACH-105564	Energy Conversion and Increased Efficiency in Internal Combustion Engines		Prüfung (PR)	Koch
SS 2019	76-T-MACH-105564	Energy Conversion and Increased Efficiency in Internal Combustion Engines		Prüfung (PR)	Koch, Kubach

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 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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. APR und DVA
9. Combustion in Diesel engines
10. Emissions
11. Waste heat recovery
12. Measures to increase efficiency

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

T 6.58 Course: Energy Efficient Intralogistic Systems [T-MACH-105151]

Responsible: Dr.-Ing. Meike Braun
Dr.-Ing. Frank Schönung

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2117500	Energy efficient intralogistic systems	2 SWS	Lecture (V)	Braun, Schönung
Exams					
WS 18/19	76-T-MACH-105151	Energy Efficient Intralogistic Systems		Prüfung (PR)	Braun
SS 2019	76-T-MACH-105151	Energy Efficient Intralogistic Systems		Prüfung (PR)	Braun

Competence Certificate
Oral, 30 min. examination dates after the end of each lesson period.

Prerequisites
none

Recommendation
The content of course “Basics of Technical Logistics” should be known.

Annotation
Visit the IFL homepage of the course for the course dates and/or possible limitations of course participation.

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

V Energy efficient intralogistic systems

2117500, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations, black board

Notes
The content of course “Basics of Technical Logistics” should be knownn.

Learning Content
The main focuses of the course are:

- green supply chain
- processes in Intralogistic systems
- evaluation of energy consumption of conveyors
- modeling of conveying systems
- methods for energy savings
- approaches for energy efficiency increasing of continuous and discontinuous conveyors
- dimensioning energy efficient drives
- new approaches for resource efficient conveying systems.

Annotation
Visit the IFL homepage of the course for the course dates and/or possible limitations of course participation

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

Literature
None.

T 6.59 Course: Energy Policy [T-WIWI-102607]

Responsible: Prof. Dr. Martin Wietschel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energiewirtschaft
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each summer term	3

Events					
SS 2019	2581959	Energy Policy	2 SWS	Lecture (V)	Wietschel
Exams					
WS 18/19	7981959	Energy Policy		Prüfung (PR)	Fichtner

Competence Certificate
In all **Master's** degreeprograms the following applies: The exam is offered to first-time applicants for the last time in the winter semester 2017/18. The exam will continue to be offered in the **bachelor's** degree programs.

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, 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 6.60 Course: Engine Measurement Techniques [T-MACH-105169]

Responsible: Dr.-Ing. Sören Bernhardt
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2134137	Engine measurement techniques	2 SWS	Lecture (V)	Bernhardt

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, 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 6.61 Course: Environmental Law [T-INFO-101348]

Responsible: Prof. Dr. Matthias Bäcker
Organisation: KIT Department of Informatics
Part of: M-INFO-101217 - Öffentliches Wirtschaftsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	24140	Umweltrecht	2 SWS	Lecture (V)	Marsch
Exams					
WS 18/19	7500050	Environmental Law		Prüfung (PR)	Marsch
SS 2019	7500082	Environmental Law		Prüfung (PR)	Marsch

T 6.62 Course: European and International Law [T-INFO-101312]

Responsible: Ulf Brühann
Organisation: KIT Department of Informatics
Part of: M-INFO-101217 - Öffentliches Wirtschaftsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	24666	Europäisches und Internationales Recht	2 SWS	Lecture (V)	Brühann
Exams					
WS 18/19	7500048	European and International Law		Prüfung (PR)	Marsch
SS 2019	7500084	European and International Law		Prüfung (PR)	Marsch

T 6.63 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104904 - Physik

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	1	Each summer term	3

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-PHYS-101092 - Climatology must have been passed.

T 6.64 Course: Exchanges [T-WIWI-102625]

Responsible: Dr. Jörg Franke
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101402 - eFinance
M-WIWI-101465 - Topics in Finance I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	1,5	Each summer term	1

Exams				
WS 18/19	7900062	Exchanges	Prüfung (PR)	Franke, Ruckes

Competence Certificate
The examination will be offered latest until winter term 2018/2019 (repeaters only).

Prerequisites
None

Recommendation
None

T 6.65 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 - Wirtschaftsprivatrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	9	Each term	2

Events					
WS 18/19	24011	Commercial and Corporate Law	2 SWS	Lecture (V)	Wiele
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
Exams					
WS 18/19	7500108	Commercial Law		Prüfung (PR)	Dreier, Matz

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-INFO-101190 - Introduction to Civil Law must have been passed.

T 6.66 Course: Experimental Physics [T-PHYS-100278]

Responsible: Prof. Dr. Thomas Schimmel
Organisation: KIT Department of Physics
Part of: M-PHYS-100283 - Experimentalphysik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	14	Each term	1

Events					
WS 18/19	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 18/19	4040112	Übungen zur Experimentalphysik A für die Studiengänge Chemie, Biologie, Chemische Biologie, Geodäsie und Geoinformatik, Angewandte Geowissenschaften, Geoökologie, technische Volkswirtschaftslehre, Lehramt Chemie, NWT Lehramt, Lebensmittelchemie, Materialwissenschaft und Werkstofftechnik (MWT) und Diplom-Ingenieurpädagogik	2 SWS	Practice (Ü)	Schimmel, Wertz
SS 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
Exams					

WS 18/19	7800001	Experimental Physics	Prüfung (PR)	Schimmel

Competence Certificate
Written exam (usually about 180 min)

Prerequisites
None

T 6.67 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 - Anwendungen des Operations Research
M-WIWI-101414 - Methodische Grundlagen des OR
M-WIWI-101421 - Supply Chain Management
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	4

Events					
WS 18/19	2550486	Facility Location and Strategic Supply Chain Management	2 SWS	Lecture (V)	Nickel
WS 18/19	2550487	Übungen zu Standortplanung und strategisches SCM	1 SWS	Practice (Ü)	Bakker
Exams					
WS 18/19	7900221	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.

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

V Facility Location and Strategic Supply Chain Management

2550486, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Since the classical work "Theory of the Location of Industries" of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.

Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

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

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

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 6.68 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 - Grundlagen BWL 2
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	1

Events					
WS 18/19	2600002	Rechnungswesen I	2 SWS	Lecture (V)	Strych
WS 18/19	2600003	Übung zu Rechnungswesen	2 SWS	Practice (Ü)	Strych
Exams					
WS 18/19	7900244	Financial Accounting and Cost Accounting		Prüfung (PR)	Ruckes
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 Rechnungswesen I

2600002, WS 18/19, 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 6.69 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2530242	Financial Accounting for Global Firms	2 SWS	Lecture (V)	Luedecke
WS 18/19	2530243	Übung zu Financial Accounting for Global Firms	SWS	Practice (Ü)	Luedecke
Exams					
WS 18/19	7900142	Financial Accounting for Global Firms		Prüfung (PR)	Luedecke
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 18/19, 2 SWS, 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 6.70 Course: Financial Econometrics [T-WIWI-103064]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101599 - Statistik und Ökonometrie
M-WIWI-101608 - Statistik und Ökonometrie
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

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 6.71 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2530232	Financial Intermediation	2 SWS	Lecture (V)	Ruckes
WS 18/19	2530233	Übung zu Finanzintermediation	1 SWS	Practice (Ü)	Ruckes, Hoang, Benz
Exams					
WS 18/19	7900063	Financial Intermediation		Prüfung (PR)	Ruckes
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

2530232, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description

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

Learning Content

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

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

Literature
Elective literature:

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

T 6.72 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	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					
WS 18/19	7900060	Financial Management		Prüfung (PR)	Ruckes
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, 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 6.73 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 - Grundlagen der Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2500002	Exercises to Foundations of Informatics I	SWS	Practice (Ü)	Sure-Vetter, Färber, Nguyen, Weller
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					
WS 18/19	7900011	Foundations of Informatics I		Prüfung (PR)	Sure-Vetter
SS 2019	7900035	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 Exercises to Foundations of Informatics I

2500002, SS 2019, SWS, 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.

V Foundations of Informatics I

2511010, SS 2019, 2 SWS, 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 preperation 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, 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 6.74 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 - Grundlagen der Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2511012	Foundations of Informatics II	3 SWS	Lecture (V)	Rettinger
WS 18/19	2511013	Tutorien zu Grundlagen der Informatik II	1 SWS	Tutorial (Tu)	Rettinger, Nguyen
Exams					
WS 18/19	7900012	Foundations of Informatics II		Prüfung (PR)	Sure-Vetter
SS 2019	7900050	Foundations of Informatics II		Prüfung (PR)	Shukla

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 18/19, 3 SWS, Open in study portal **Lecture (V)**

Learning Content
The lecture deals with formal models for automata, languages and algorithms as well as real instances of these models, i.e. computer architecture and organization (hardware development, computer arithmetic, architecture models), 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).

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

Literature
Elective literature:

Will be announced in the lecture.

T 6.75 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 und Service Management
M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-104900 - Betriebswirtschaftslehre
M-WIWI-104911 - Information Systems & Digital Business: Interaction
M-WIWI-104913 - Information Systems & Digital Business: Servitization

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2540560	Foundations of Interactive Systems	3 SWS	Lecture (V)	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, 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 6.76 Course: Foundations of Mobile Business [T-WIWI-104679]

Responsible: Prof. Dr. Andreas Oberweis
Dr.-Ing. Gunther Schiefer

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	2

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					
WS 18/19	7900118	Foundations of mobile Business		Prüfung (PR)	Oberweis
SS 2019	7900001	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

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

Annotation
Lecture and exercises are integrated.

T 6.77 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 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2133108	Fuels and Lubricants for Combustion Engines	2 SWS	Lecture (V)	Kehrwald
Exams					
WS 18/19	76-T-MACH-105184	Fuels and Lubricants for Combustion Engines		Prüfung (PR)	
SS 2019	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

2133108, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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 6.78 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 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2134138	Fundamentals of catalytic exhaust gas aftertreatment	2 SWS	Lecture (V)	Lox, Grunwaldt, Deutschmann
Exams					
WS 18/19	76-T-MACH-105044	Fundamentals of Catalytic Exhaust Gas Aftertreatment		Prüfung (PR)	
SS 2019	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, 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 6.79 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 - Industrielle Produktion I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	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, 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 6.80 Course: Gas Engines [T-MACH-102197]

Responsible: Dr.-Ing. Rainer Golloch
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Competence Certificate
Oral examination, duration 25 min., no auxillary means

Prerequisites
none

T 6.81 Course: Gear Cutting Technology [T-MACH-102148]

Responsible: Dr. Markus Klaiber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2149655	Gear Cutting Technology	2 SWS	Lecture (V)	Klaiber
Exams					
WS 18/19	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 Cutting Technology

2149655, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:

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

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 6.82 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 - Allgemeine und Anorganische Chemie

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	7	Each winter term	1

Events					
WS 18/19	5004	Allgemeine und Anorganische Chemie (für Studierende des Chemieingenieurwesens)	3 SWS	Lecture (V)	Ruben
WS 18/19	5005	Seminar zur Vorlesung Allgemeine und Anorganische Chemie (für Studierende des Chemieingenieurwesens)	2 SWS	Seminar (S)	Scheiba
Exams					
WS 18/19	7100003	General and Inorganic Chemistry		Prüfung (PR)	Anson, Ruben
WS 18/19	7100004	General and Inorganic Chemistry		Prüfung (PR)	Ruben, Anson

T 6.83 Course: Geological Hazards and Risks for external students [T-PHYS-103117]

Responsible: Dr. Ellen Gottschämmer
Organisation: KIT Department of Physics
Part of: M-WIWI-101646 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104904 - Physik

Type	Credits	Version
Prüfungsleistung mündlich	4	1

Events					
WS 18/19	4060121	Geological Hazards and Risk	2 SWS	Lecture (V)	Gottschämmer, Daniell
WS 18/19	4060122	Exercises on Geological Hazards and Risk	2 SWS	Practice (Ü)	Gottschämmer, Daniell

T 6.84 Course: Global Optimization I [T-WIWI-102726]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101413 - Anwendungen des Operations Research
M-WIWI-101414 - Methodische Grundlagen des OR
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7900007_NK_WS1819	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-103638 - Global Optimization I and II must not have been started.

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 6.85 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 - Methodische Grundlagen des OR
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each summer term	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					
WS 18/19	7900001_NK_WS1819	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102726 - Global Optimization I must not have been started.
2. The course T-WIWI-102727 - Global Optimization II must not have been started.

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 6.86 Course: Global Optimization II [T-WIWI-102727]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101414 - Methodische Grundlagen des OR
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7900152_NK_WS1819	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-103638 - Global Optimization I and II must not have been started.

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 6.87 Course: Human Resource Management [T-WIWI-102909]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101513 - Personal und Organisation
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2573003	Human Resource Management	2 SWS	Lecture (V)	Nieken
WS 18/19	2573004	Übung zu Human Resource Management	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
WS 18/19	7900200	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

2573003, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The students acquire basic knowledge in the fields of human resource planning, selection and talent management. Different processes and instruments and their link to corporate strategy are evaluated based on microeconomic and behavioral approaches. The results are tested and discussed based on empirical data.

Annotation
Recommendations
Completion of module Business Administration is recommended.
Basic knowledge of microeconomics, game theory, and statistics is recommended.

Workload
The total workload for this course is approximately 135 hours.

Lecture 32h

Preparation of lecture 52h

Exam preparation 51h

Literature

- Personnel Economics in Practice, Lazear & Gibbs, John Wiley & Sons, 2014
- Strategic Human Resources. Frameworks for General Managers, Baron & Kreps, John Wiley & Sons, 1999

T 6.88 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	1

Events					
WS 18/19	6200511	Wasserbau und Wasserwirtschaft [bauiBFP4-WASSER]	2 SWS	Lecture (V)	Nestmann
WS 18/19	6200512	Übungen zu Wasserbau und Wasserwirtschaft [bauiBFP4-WASSER]	1 SWS	Practice (Ü)	Seidel
Exams					
WS 18/19	8230101667	Hydraulic Engineering and Water Management		Prüfung (PR)	Nestmann

Competence Certificate
written exam with 60 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 6.89 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	2

Events					
WS 18/19	6200513	Hydrologie [bauiBFP4-WASSER]	2 SWS	Lecture (V)	Zehe, Wienhöfer
WS 18/19	6200514	Übungen zu Hydrologie [bauiBFP4-WASSER]	1 SWS	Practice (Ü)	Zehe, Wienhöfer
Exams					
WS 18/19	8230101693	Hydrology		Prüfung (PR)	Zehe

Prerequisites
None

Recommendation
None

Annotation
None

T 6.90 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	2

Events					
WS 18/19	2123900	I4.0 Systems platform	4 SWS	Project/Seminar (PJ/S)	Ovtcharova, Maier
SS 2019	2123900	I4.0 Systems platform	4 SWS	Project/Seminar (PJ/S)	Ovtcharova, Maier
Exams					
WS 18/19	76-T-MACH-106457	I4.0 Systems platform		Prüfung (PR)	Ovtcharova

Competence Certificate
Alternative exam assessment (project work)

Prerequisites
None

Annotation
Limited number of participants.

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

V I4.0 Systems platform

2123900, SS 2019, 4 SWS, Open in study portal — **Project/Seminar (PJ/S)**

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 6.91 Course: Industrial Organization [T-WIWI-102844]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101420 - Ökonometrie und VWL
M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	79191IO	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, 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 6.92 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	2

Events					
SS 2019	2122014	Information Engineering	2 SWS	Seminar (S)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102209	Information Engineering		Prüfung (PR)	Ovtcharova

Competence Certificate
Alternative exam assessment (written composition and speech)

Prerequisites
None

T 6.93 Course: Information Security [T-WIWI-108387]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	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 18/19	7900074	Information Security		Prüfung (PR)	Volkamer
SS 2019	7900064	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.

Prerequisites
None.

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 6.94 Course: Information Systems and Supply Chain Management [T-MACH-102128]

Responsible: Dr. Christoph Kilger
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	2

Events					
SS 2019	2118094	Information Systems in Logistics and Supply Chain Management	2 SWS	Lecture (V)	Kilger
Exams					
WS 18/19	76T-MACH-102128	Information Systems and Supply Chain Management		Prüfung (PR)	Mittwollen
WS 18/19	76-T-MACH-102128	Information Systems and Supply Chain Management		Prüfung (PR)	Mittwollen
SS 2019	76-T-MACH-102128	Information Systems and Supply Chain Management		Prüfung (PR)	Mittwollen

Competence Certificate
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

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

V Information Systems in Logistics and Supply Chain Management

2118094, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations

Learning Content
1) Overview of logistics systems and processes
2) Basic concepts of information systems and information technology
3) Introduction to IS in logistics: Overview and applications
4) Detailed discussion of selected SAP modules for logistics support

Annotation
none

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

Literature
Stadtler, Kilger: Supply Chain Management and Advanced Planning, Springer, 4. Auflage 2008

T 6.95 Course: Integrated Information Systems for Engineers [T-MACH-102083]

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

Part of: M-MACH-101270 - Product Lifecycle Management

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2121001	Integrated Information Systems for engineers	3 SWS	Lecture / Practice (VÜ)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102083	Integrated Information Systems for Engineers		Prüfung (PR)	Ovtcharova

Competence Certificate
Oral examination 20 min.

Prerequisites
None

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

V Integrated Information Systems for engineers

2121001, SS 2019, 3 SWS, 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 6.96 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 - Integrierte Produktionsplanung

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each summer term	1

Events					
SS 2019	2150660	Integrated Production Planning in the Age of Industry 4.0	6 SWS	Lecture / Practice (VÜ)	Lanza
Exams					
WS 18/19	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, Open in study portal — **Lecture / Practice (VÜ)**

Description
Media:

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

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 6.97 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 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	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, Open in study portal

Description
Media:

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

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 6.98 Course: Interdisciplinary Approach to Verifiable e-Voting [T-WIWI-108716]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	1

Events					
WS 18/19	2511552	Interdisciplinary approach to verifiable e-voting	2 SWS	Lecture (V)	Kulyk
Exams					
WS 18/19	7900066	Interdisciplinary Approach to Verifiable E-Voting		Prüfung (PR)	Volkamer
SS 2019	7900089	Interdisciplinary Approach to Verifiable E-Voting		Prüfung (PR)	Volkamer

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

Prerequisites
None.

Annotation
The lecture will not be held in the summer semester 2019.

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

V Interdisciplinary approach to verifiable e-voting

2511552, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The course consists of two parts. The first part is a lecture explaining the background of e-voting technologies and their applications in real-life elections. The lecture will consist of six parts, covering the following topics:

- Overview, including different types of e-voting systems, their advantages and disadvantages and real-world examples.
- Security of e-voting: requirements, adversary models, common risks.
- Verifiability of e-voting: definition and motivation of verifiability as well as its limitations.
- Further relevant topics, including long-term privacy, usability, use of new technologies such as blockchain.

The second part of the course takes part as a seminar, where the students have to present and discuss a specific topic with other participants. The seminar talk is a prerequisite for the participation in the final exam. The seminar topics will be distributed after all the foundations are covered in the lecture. After the topics are distributed, the students have three weeks to prepare their seminar talks. The talks will take place within one or several block seminars, depending on the number of the participating students.

The seminar includes following topics:

- Report on a specific e-voting system or state of e-voting in specific country. The report can focus either on technological aspects such as the cryptographic protocol, or on practical experiences.
- A more in-depth talk on one of the issues from the lecture, such as cryptographical aspects or studies on usability and acceptance of e-voting systems

T 6.99 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2530570	International Finance	2 SWS	Lecture (V)	Walter, Uhrig-Homburg
Exams					
WS 18/19	7900052	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, 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 6.100 Course: International Marketing [T-WIWI-102807]

Responsible: Dr. Sven Feurer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101424 - Grundlagen des Marketing
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	1,5	Each winter term	1

Events					
WS 18/19	2572155	International Marketing	1 SWS	Lecture (V)	Feurer
Exams					
WS 18/19	7900123	International Marketing		Prüfung (PR)	Klarmann
WS 18/19	7900128	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 18/19, 1 SWS, Open in study portal — **Lecture (V)**

Description
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.

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 6.101 Course: Internet Law [T-INFO-101307]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	2

Events					
WS 18/19	24354	Internet Law	2 SWS	Lecture (V)	Dreier
Exams					
WS 18/19	7500060	Internet Law		Prüfung (PR)	Dreier, Matz
SS 2019	7500057	Internet Law		Prüfung (PR)	Dreier, Matz

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-INFO-108462 - Selected legal issues of Internet law must not have been started.

T 6.102 Course: Internship [T-WIWI-102756]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101610 - Berufspraktikum

Type	Credits	Version
Studienleistung	10	1

Competence Certificate
See module description

Prerequisites
See module description

Recommendation
See module description

Annotation
See module description

T 6.103 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 - Energiewirtschaft
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5,5	Each summer term	2

Events					
SS 2019	2581010	Introduction to Energy Economics	2 SWS	Lecture (V)	Fichtner, Sandmeier
SS 2019	2581011	Übungen zu Einführung in die Energiewirtschaft	2 SWS	Practice (Ü)	Lehmann, Kleinebrahm, Jochem, Sandmeier
Exams					
WS 18/19	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, 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 6.104 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	6339057	Einführung in die Ingenieurgeologie	4 SWS	Lecture / Practice (VÜ)	Blum
Exams					
WS 18/19	8210_101500	Introduction to Engineering Geology		Prüfung (PR)	Blum

Prerequisites
none

T 6.105 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 - Angewandte Mikroökonomik
M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7900212	Introduction to Game Theory		Prüfung (PR)	Puppe

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, 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 6.106 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	3	Each winter term	1

Events					
WS 18/19	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (VÜ)	Rösch, Wursthorn
Exams					
WS 18/19	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences		Prüfung (PR)	Rösch, Wursthorn
WS 18/19	8280103541	Introduction to GIS for Students of Natural, Engineering and Geo Sciences		Prüfung (PR)	Rösch, Wursthorn

T 6.107 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6071101	Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü	4 SWS	Lecture / Practice (VÜ)	Rösch, Wursthorn
Exams					
WS 18/19	8280101681	Introduction to GIS for Students of Natural, Engineering and Geo Sciences		Prüfung (PR)	Rösch, Wursthorn

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-103541 - Introduction to GIS for Students of Natural, Engineering and Geo Sciences must have been passed.

T 6.108 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2141861	Introduction to Microsystem Technology I	2 SWS	Lecture (V)	Korvink, Badilita
Exams					
WS 18/19	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 18/19, 2 SWS, 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 6.109 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2142874	Introduction to Microsystem Technology II	2 SWS	Lecture (V)	Korvink, Badilita
Exams					
WS 18/19	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

2142874, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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 6.110 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 - Einführung in das Operations Research
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	see Annotations	1

Events					
WS 18/19	2530043	Introduction to Operations Research II	2 SWS	Lecture (V)	Nickel
WS 18/19	2530044	Tutorien zu Einführung in das Operations Research II	SWS	Tutorial (Tu)	Nickel, Dunke, Assistenten
SS 2019	2550040	Introduction to Operations Research I	2+2 SWS	Lecture (V)	Stein
Exams					
WS 18/19	7900156	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 II

2530043, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Integer and Combinatorial Programming: Basic notions, cutting plane metehods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dyanical and stochastic inventory models, queuing theory.

Learning Content
Integer and Combinatorial Programming: Basic notions, cutting plane metehods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dyanical and stochastic inventory models, queuing theory.

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

V Introduction to Operations Research I

2550040, SS 2019, 2+2 SWS, 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 6.111 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 - Einführung in die Programmierung
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	2

Events					
WS 18/19	2511000	Introduction to Programming with Java	3 SWS	Lecture (V)	Zöllner
WS 18/19	2511002	Tutorien zu Programmieren I: Java	1 SWS	Tutorial (Tu)	Zöllner, Struppek, Ulrich
WS 18/19	2511003	Rechnerpraktikum zu Programmieren I: Java	2 SWS	Practice (PÜ)	Zöllner, Struppek, Ulrich
WS 18/19	2511004	Tutorien zu Programmieren I: Java	1 SWS	Tutorial (Tu)	Zöllner, Struppek, Ulrich
Exams					
WS 18/19	7900018	Introduction to Programming with Java		Prüfung (PR)	Zöllner
SS 2019	7900042	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 18/19, 3 SWS, Open in study portal **Lecture (V)**

Learning Content
The lecture "Introduction to Programming with Java " introduces systematic programming and provides essential practical basics for all advanced computer science lectures.

Based on considerations of the structured and systematic design of algorithms, the most important constructs of modern higher programming languages as well as programming methods are explained and illustrated with examples. One focus of the lecture is on teaching the concepts of object-oriented Programming. Java is used as the programming language. Knowledge of this language is required in advanced computer science lectures.

At the end of the lecture period, a written examination will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

Annotation
see German version

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

Literature

Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018

T 6.112 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 - Finanzwissenschaft
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2560131	Introduction to Public Finance	3 SWS	Lecture (V)	Wigger
Exams					
WS 18/19	790fiwi	Introduction to Public Finance		Prüfung (PR)	Wigger
SS 2019	790fiwi	Introduction to Public Finance		Prüfung (PR)	Wigger

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation SPO 2015.

Prerequisites
None

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

V Introduction to Public Finance
2560131, WS 18/19, 3 SWS, 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 6.113 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 - Methodische Grundlagen des OR
M-WIWI-103278 - Optimierung unter Unsicherheit
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	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					
WS 18/19	7900143	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 6.114 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2530575	Investments	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530576	Übung zu Investments	1 SWS	Practice (Ü)	Uhrig-Homburg
Exams					
WS 18/19	7900054	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 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
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, 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 6.115 Course: Laboratory Production Metrology [T-MACH-108878]

Responsible: Dr.-Ing. Benjamin Häfner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each summer term	1

Events					
SS 2019	2150550	Laboratory Production Metrology	3 SWS	Practical course (P)	Häfner

Competence Certificate
Alternative test achievement:
Group presentation

Prerequisites
none

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

V Laboratory Production Metrology

2150550, SS 2019, 3 SWS, 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
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).

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 6.116 Course: Laboratory Work in General and Inorganic Chemistry [T-CHEMBIO-108287]

Organisation: KIT Department of Chemistry and Biosciences
Part of: M-CHEMBIO-104026 - Anorganisch-Chemisches Praktikum

Type	Credits	Version
Prüfungsleistung anderer Art	7	1

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

Prerequisites
none

T 6.117 Course: Law of Contracts [T-INFO-101316]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101216 - Recht der Wirtschaftsunternehmen
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
SS 2019	24671	Law of Contracts	2 SWS	Lecture (V)	Hoff
Exams					
WS 18/19	7500059	Law of Contracts		Prüfung (PR)	Dreier, Matz
SS 2019	7500055	Law of Contracts		Prüfung (PR)	Dreier, Matz

T 6.118 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 - Vertiefung der Produktionstechnik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each winter term	2

Events					
WS 18/19	2149612	Lernfabrik Globale Produktion	2 SWS	Seminar / Practical course (S/P)	Lanza
Exams					
WS 18/19	76-T-MACH-105783	Learning Factory "Global Production"		Prüfung (PR)	Lanza

Competence Certificate
Alternative test achievement (graded):

- Knowledge acquisition in the context of the seminar (3 achievements 20 min each) with weighting 40%.
- Interaction between participants with weighting 15%.
- Scientific colloquium (in groups of 3 students approx. 45 min each) with weighting 45%.

Prerequisites
Successful completion of one of the following courses:

- Integrated Production Planning in the Age of Industry 4.0 [T-MACH-108849 or T-MACH-109054]
- Integrated Production Planning [T-MACH-102106]
- Global Production and Logistics – Part 1: Global Production [T-MACH-105158]
- Quality Management [T-MACH-102107]

Modeled Conditions
You have to fulfill one of 5 conditions:

1. The course T-MACH-102106 - Integrated Production Planning must have been passed.
2. The course T-MACH-105158 - Global Production and Logistics - Part 1: Global Production must have been passed.
3. The course T-MACH-102107 - Quality Management must have been passed.
4. The course T-MACH-108849 - Integrated Production Planning in the Age of Industry 4.0 must have been passed.
5. The course T-MACH-109054 - Integrated Production Planning in the Age of Industry 4.0 must have been passed.

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

V Lernfabrik Globale Produktion

2149612, WS 18/19, 2 SWS, Open in study portal — **Seminar / Practical course (S/P)**

Description
Media:
e-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (https://ilias.studium.kit.edu/).

Notes
For organizational reasons the number of participants for the course is limited to 20. Hence a selection process will take place. Applications are made via the homepage of wbk (http://www.wbk.kit.edu/studium-und-lehre.php).

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

Workload
e-Learning: ~ 24 h
regular attendence: ~ 36 h
self-study: ~ 60 h

T 6.119 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each summer term	1

Events					
SS 2019	2118078	Logistics - Organisation, Design, and Control of Logistic Systems	3 SWS	Lecture (V)	Furmans
Exams					
WS 18/19	76-T-MACH-102089	Logistics - Organisation, Design and Control of Logistic Systems		Prüfung (PR)	Furmans, Mittwollen
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, 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 6.120 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 - Industrielle Produktion I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each summer term	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					
WS 18/19	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

2581996, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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 6.121 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 - Werkzeugmaschinen und Handhabungstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each winter term	2

Events					
WS 18/19	2149902	Machine Tools and Industrial Handling	6 SWS	Lecture / Practice (VÜ)	Fleischer
Exams					
WS 18/19	76-T-MACH-102158-MIT	Machine Tools and Industrial Handling		Prüfung (PR)	Fleischer
WS 18/19	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 18/19, 6 SWS, Open in study portal — **Lecture / Practice (VÜ)**

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

Notes
Lectures on Mondays and Wednesdays, tutorial on Thursdays.
The tutorial dates will announced in the first lecture.

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 6.122 Course: Macroeconomic Theory [T-WIWI-109121]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-101668 - Wirtschaftspolitik I
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	2

Events					
WS 18/19	2560404	Macroeconomic Theory	2 SWS	Lecture (V)	Brumm
WS 18/19	2560405	Übung zu Macroeconomic Theory	1 SWS	Practice (Ü)	Pegorari
Exams					
WS 18/19	7900264	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
Successful completion of all relevant modules from the basic program.

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

V Macroeconomic Theory

2560404, WS 18/19, 2 SWS, 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 6.123 Course: Management Accounting 1 [T-WIWI-102800]

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101498 - Controlling (Management Accounting)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

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					
WS 18/19	79-2579900-00	Management Accounting 1		Prüfung (PR)	Wouters
SS 2019	79-2579900-00	Management Accounting 1		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

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

V Management Accounting 1

2579900, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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.

T 6.124 Course: Management Accounting 2 [T-WIWI-102801]

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101498 - Controlling (Management Accounting)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2579902	Management Accounting 2	2 SWS	Lecture (V)	Wouters
WS 18/19	2579903	Übung zu Management Accounting 2	2 SWS	Practice (Ü)	Wouters, Mickovic
Exams					
WS 18/19	79-2579902-00	Management Accounting 2		Prüfung (PR)	Wouters
SS 2019	79-2579902-00	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.

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

V Management Accounting 2

2579902, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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.

T 6.125 Course: Management and Strategy [T-WIWI-102629]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategie und Organisation
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each summer term	1

Events					
SS 2019	2577900	Management and Strategy	2 SWS	Lecture (V)	Lindstädt
Exams					
WS 18/19	7900199	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, 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 6.126 Course: Managing Organizations [T-WIWI-102630]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategie und Organisation
M-WIWI-101513 - Personal und Organisation
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	3

Events					
WS 18/19	2577902	Managing Organizations	2 SWS	Lecture (V)	Lindstädt, Burkardt, Jung
Exams					
WS 18/19	7900049	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 18/19, 2 SWS, 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 6.127 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 - Grundlagen des Marketing
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

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

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 Managing the Marketing Mix
2571152, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The content of this course concentrates on the four elements of the marketing mix. Therefore the four main chapters are:

- Product management
- Pricing
- Promotion
- Sales management

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 6.128 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 - Fertigungstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each winter term	3

Events					
WS 18/19	2149657	Manufacturing Technology	6 SWS	Lecture / Practice (VÜ)	Schulze, Zanger
Exams					
WS 18/19	76-T-MACH-102105	Manufacturing Technology		Prüfung (PR)	Schulze
WS 18/19	76-T-MACH-102105-Mündl.	Manufacturing Technology		Prüfung (PR)	Schulze
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

2149657, WS 18/19, 6 SWS, Open in study portal — **Lecture / Practice (VÜ)**

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

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 6.129 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 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	6	Each winter term	2

Events					
WS 18/19	2117051	Material flow in logistic systems	4 SWS	Others (sonst.)	Furmans
Exams					
WS 18/19	76-T-MACH-102151	Material Flow in Logistic Systems		Prüfung (PR)	Furmans
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 18/19, 4 SWS, 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. 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).

Media: Presentations, black board, book, video recordings

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
none

Workload
Regular attendance: 30 h

Self-study: 100 h

Group work: 50 h

Literature
Arnold, Dieter; Furmans, Kai : Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 2009

T 6.130 Course: Materials and Processes for Body Leightweight Construction in the Automotive Industry [T-MACH-105166]

Responsible: Dr. Stefan Kienzle
Dr. Dieter Steegmüller

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2149669	Materials and Processes for Body Lightweight Construction in the Automotive Industry	2 SWS	Lecture (V)	Steegmüller, Kienzle
Exams					
WS 18/19	76-T-MACH-105166	Materials and Processes for Body Leightweight Construction in the Automotive Industry		Prüfung (PR)	Schulze

Competence Certificate
Oral Exam (20 min)

Prerequisites
none

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

V Materials and Processes for Body Lightweight Construction in the Automotive Industry

Lecture (V)

2149669, WS 18/19, 2 SWS, Open in study portal

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

Notes
The lecture is a block course. An application in Ilias is mandatory.

Learning Content
The objective of the lecture is to build up an overview of the relevant materials and processes for the production of a lightweight body. This includes both the actual production and the joining for the body. The lecture covers the different lightweight approaches and possible fields of application in the automotive industry. The methods are discussed with practical examples from the automotive industry.
The following topics will be covered:

- lightweight designs
- aluminium and steel for lightweight construction
- fiber-reinforced plastics by the RTM and SMC process
- joining of steel and aluminium (clinching, riveting, welding)
- bonding
- coating
- finishing
- quality assurance
- virtual factory

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

T 6.131 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 - Mathematik 1
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung schriftlich	3,5	1

Exams				
WS 18/19	6700013	Mathematics I - Final Exam	Prüfung (PR)	Folkers, Last, Winter
WS 18/19	6700014	Mathematics I - Final Exam	Prüfung (PR)	Winter, Last, Folkers

T 6.132 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 - Mathematik 1
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung schriftlich	3,5	1

Events					
WS 18/19	0135000	Mathematik 1 für die Fachrichtung Wirtschaftswissenschaften	4 SWS	Lecture (V)	Folkers
WS 18/19	0135100	Übungen zu 0135000	2 SWS	Practice (Ü)	Folkers
Exams					
WS 18/19	6700040	Mathematics I - Midterm Exam		Prüfung (PR)	Winter, Last, Folkers
WS 18/19	6700065	Mathematics I - Midterm Exam		Prüfung (PR)	Winter, Last, Folkers

T 6.133 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 - Mathematik 2
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung schriftlich	3,5	1

T 6.134 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 - Mathematik 2
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung schriftlich	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

T 6.135 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 - Mathematik 3
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung schriftlich	7	1

Events					
WS 18/19	0135200	Mathematik 3 für die Fachrichtung Wirtschaftswissenschaften	4 SWS	Lecture (V)	Winter
WS 18/19	0135300	Übungen zu 0135200	2 SWS	Practice (Ü)	Winter
Exams					
WS 18/19	6700031	Mathematics III - Final Exam		Prüfung (PR)	Winter, Last
WS 18/19	6700051	Mathematics III - Final Exam		Prüfung (PR)	Winter

T 6.136 Course: Mechanical Design I and II - CIW [T-MACH-104739]

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101299 - Maschinenkonstruktionslehre
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each winter term	2

Events					
WS 18/19	2145179	Mechanical Design I (CIW/VT/MIT/IP-M)	2 SWS	Lecture (V)	Albers, Matthiesen, Behrendt
SS 2019	2146195	Mechanical Design II (CIW/VT/MIT/IP-M)	2 SWS	Lecture (V)	Albers
Exams					
WS 18/19	76-T-MACH-104739	Mechanical Design I and II		Prüfung (PR)	Albers, Matthiesen

Competence Certificate
Written Exam (90min) on the topics of MKLI and MKLII for CIW.

Prerequisites
The bricks "T-MACH-102132 - Maschinenkonstruktionslehre I, Vorleistung" and "T-MACH-102133 - Maschinenkonstruktionslehre II, Vorleistung" must be passed successfully.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102133 - Mechanical Design II, Tutorial must have been passed.
2. The course T-MACH-102132 - Mechanical Design I, Tutorial must have been passed.

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

V Mechanical Design I (CIW/VT/MIT/IP-M)

2145179, WS 18/19, 2 SWS, 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

V Mechanical Design II (CIW/VT/MIT/IP-M)

2146195, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Description
Media:

Beamer

Visualizer

Mechanical components

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)

T 6.137 Course: Mechanical Design I, Tutorial [T-MACH-102132]

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101299 - Maschinenkonstruktionslehre
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	1	Each winter term	2

Events					
WS 18/19	2145195	Tutorials Mechanical Design I (CIW/VT/MIT/IP-M)	1 SWS	Practice (Ü)	Albers, Matthiesen, Behrendt, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102132	Mechanical Design I, Tutorial		Prüfung (PR)	Matthiesen, Albers

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. In addition, participation in an online test is a prerequisite

Prerequisites
None

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

V Tutorials Mechanical Design I (CIW/VT/MIT/IP-M)

2145195, WS 18/19, 1 SWS, 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 6.138 Course: Mechanical Design II, Tutorial [T-MACH-102133]

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101299 - Maschinenkonstruktionslehre
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	1	Each summer term	2

Events					
SS 2019	2146196	Tutorials Mechanical Design II (CIW/VT/MIT/IP-M)	2 SWS	Practice (Ü)	Matthiesen, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102133	Mechanical Design II, Tutorial		Prüfung (PR)	Matthiesen
SS 2019	76-T-MACH-102133	Mechanical Design II, Tutorial		Prüfung (PR)	Albers, Matthiesen

Competence Certificate
IP-MATH-CIW-NWT: 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 II (CIW/VT/MIT/IP-M)

2146196, SS 2019, 2 SWS, Open in study portal **Practice (Ü)**

Description
Media:
Beamer
Visualizer

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 6.139 Course: Metal Forming [T-MACH-105177]

Responsible: Dr.-Ing. Thomas Herlan
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2150681	Metal Forming	2 SWS	Lecture (V)	Herlan
Exams					
WS 18/19	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, Open in study portal — **Lecture (V)**

Description
Media:

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

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 6.140 Course: Microactuators [T-MACH-101910]

Responsible: Prof. Dr. Manfred Kohl
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2142881	Microactuators	2 SWS	Lecture (V)	Kohl
Exams					
WS 18/19	76-T-MACH-101910	Microactuators		Prüfung (PR)	Kohl

Competence Certificate
oral exam

Prerequisites
none

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

V Microactuators

2142881, SS 2019, 2 SWS, 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:

- Microelectromechnical 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

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 6.141 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 - Mobilität und Infrastruktur

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	8234101791	Mobility and Infrastructure		Prüfung (PR)	Roos

Competence Certificate
written exam, 150 min.

Prerequisites
None

Recommendation
None

Annotation
None

T 6.142 Course: Model Based Application Methods [T-MACH-102199]

Responsible: Dr. Frank Kirschbaum
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101303 - Verbrennungsmotoren II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Competence Certificate
take-home exam, short presentation with oral examination

Prerequisites
none

T 6.143 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 - Anwendungen des Operations Research
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Each summer term	1

Events					
SS 2019	2550490	Modellieren und OR-Software: Einführung	3 SWS	Practical course (P)	Nickel, Bakker

Competence Certificate
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the software laboratory and the following term.

Prerequisites
None

Recommendation
Firm knowledge of the contents from the lecture*Introduction to Operations Research I*[2550040] of the module*Operations Research*[WW1OR].

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, 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 6.144 Course: Nanotechnology with Clusterbeams [T-MACH-102080]

Responsible: Dr. Jürgen Gspann
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Competence Certificate
written examination
presence in more that 70% of the lectures
Duration: 1 h

aids: none

Prerequisites
none

T 6.145 Course: Nonlinear Optimization I [T-WIWI-102724]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101414 - Methodische Grundlagen des OR
M-WIWI-103278 - Optimierung unter Unsicherheit
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	3

Events					
WS 18/19	2550111	Nichtlineare Optimierung I	2 SWS	Lecture (V)	Stein
WS 18/19	2550112	Übungen zu Nichtlineare Optimierung I + II	SWS	Practice (Ü)	Stein, Mohr
WS 18/19	2550142	Rechnerübung zu Nichtlineare Optimierung I + II	SWS	Practice (Ü)	Stein, Mohr
Exams					
WS 18/19	7900002_HK_WS1819	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.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-103637 - Nonlinear Optimization I and II must not have been started.

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 Nichtlineare Optimierung I

2550111, WS 18/19, 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 6.146 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 - Methodische Grundlagen des OR
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each winter term	5

Events					
WS 18/19	2550111	Nichtlineare Optimierung I	2 SWS	Lecture (V)	Stein
WS 18/19	2550112	Übungen zu Nichtlineare Optimierung I + II	SWS	Practice (Ü)	Stein, Mohr
WS 18/19	2550113	Nichtlineare Optimierung II	2 SWS	Lecture (V)	Stein
WS 18/19	2550142	Rechnerübung zu Nichtlineare Optimierung I + II	SWS	Practice (Ü)	Stein, Mohr
Exams					
WS 18/19	7900151_HK_WS1819	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.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102724 - Nonlinear Optimization I must not have been started.
2. The course T-WIWI-102725 - Nonlinear Optimization II must not have been started.

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 Nichtlineare Optimierung I

2550111, WS 18/19, 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 Nichtlineare Optimierung II

2550113, WS 18/19, 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 6.147 Course: Nonlinear Optimization II [T-WIWI-102725]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101414 - Methodische Grundlagen des OR
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	2

Events					
WS 18/19	2550112	Übungen zu Nichtlineare Optimierung I + II	SWS	Practice (Ü)	Stein, Mohr
WS 18/19	2550113	Nichtlineare Optimierung II	2 SWS	Lecture (V)	Stein
Exams					
WS 18/19	7900050_HK_WS1819	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.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-103637 - Nonlinear Optimization I and II must not have been started.

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 Nichtlineare Optimierung II

2550113, WS 18/19, 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 6.148 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	2

Events					
WS 18/19	2141865	Novel actuators and sensors	2 SWS	Lecture (V)	Kohl, Sommer
Exams					
WS 18/19	76-T-MACH-102152	Novel Actuators and Sensors		Prüfung (PR)	Kohl, Sommer

Competence Certificate
oral exam (30 Min.)

Prerequisites
none

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

V Novel actuators and sensors

2141865, WS 18/19, 2 SWS, 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 6.149 Course: Operative CRM [T-WIWI-102597]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101422 - Vertiefung im Customer Relationship Management
M-WIWI-101460 - CRM und Servicemanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2540522	Operative CRM	2 SWS	Lecture (V)	Geyer-Schulz
WS 18/19	2540523	Übung Operatives CRM	1 SWS	Practice (Ü)	Schweigert
Exams					
WS 18/19	7900145	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 18/19, 2 SWS, 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 6.150 Course: Optimization under Uncertainty [T-WIWI-106545]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101413 - Anwendungen des Operations Research
M-WIWI-103278 - Optimierung unter Unsicherheit
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Irregular	1

Events					
WS 18/19	2550464	Optimierungsansätze unter Unsicherheit	SWS	Lecture (V)	Sinske
WS 18/19	2550465	Übungen zu Optimierungsansätze unter Unsicherheit	SWS	Practice (Ü)	Füllner
WS 18/19	2550466	Rechnerübungen zu Optimierungsansätze unter Unsicherheit	2 SWS	Practice (Ü)	Füllner
Exams					
WS 18/19	7900158	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 6.151 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	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					
WS 18/19	7309486	Optoelectronic Components		Prüfung (PR)	Freude
SS 2019	7309486	Optoelectronic Components		Prüfung (PR)	Freude

Prerequisites
none

T 6.152 Course: Patent Law [T-INFO-101310]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	24656	Patent Law	2 SWS	Lecture (V)	Koch
Exams					
WS 18/19	7500001	Patent Law		Prüfung (PR)	Dreier, Matz
SS 2019	7500062	Patent Law		Prüfung (PR)	Dreier, Matz

T 6.153 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 - Personal und Organisation
M-WIWI-101668 - Wirtschaftspolitik I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7900202	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

2573001, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The students acquire knowledge about the process and the strategic aspects of collective bargaining about wages. They analyze selected aspects of corporate governance and co-determination in Germany. The lecture also addresses questions of personnel politics and issue of labor market discrimination. Microeconomic and behavioral approaches as well as empirical data is used and evaluated critically.

Annotation
Is carried out routinely in summer.

Workload
The total workload for this course is approximately 135 hours.

Lecture 32h
Preparation of lecture 52h
Exam preparation 51h

Literature
Arbeitsmarktökonomik, W. Franz, Springer, 2013

T 6.154 Course: PH APL-ING-TL01 [T-WIWI-106291]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Once	1

T 6.155 Course: PH APL-ING-TL02 [T-WIWI-106292]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Once	1

T 6.156 Course: PH APL-ING-TL03 [T-WIWI-106293]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Once	1

T 6.157 Course: PH APL-ING-TL04 ub [T-WIWI-106294]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Studienleistung	0	Once	1

T 6.158 Course: PH APL-ING-TL05 ub [T-WIWI-106295]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Studienleistung	0	Once	1

T 6.159 Course: PH APL-ING-TL06 ub [T-WIWI-106296]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Studienleistung	0	Once	1

T 6.160 Course: PH APL-ING-TL07 [T-WIWI-108384]

Organisation: University
Part of: M-WIWI-101404 - Außerplanmäßiges Ingenieurmodul

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Once	1

T 6.161 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each summer term	1

Events					
SS 2019	2142890	Physics for Engineers	2 SWS	Lecture (V)	Weygand, Dienwiebel, Nesterov-Müller, Gumbsch
Exams					
WS 18/19	76-T-MACH-100530	Physics for Engineers		Prüfung (PR)	Gumbsch, Dienwiebel, Nesterov-Müller, Weygand

Competence Certificate
written exam 90 min

Prerequisites
none

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

V Physics for Engineers

2142890, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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 6.162 Course: Platform Economy [T-WIWI-109936]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101434 - eBusiness und Service Management
M-WIWI-104900 - Betriebswirtschaftslehre
M-WIWI-104911 - Information Systems & Digital Business: Interaction
M-WIWI-104912 - Information Systems & Digital Business: Platforms

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	3

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-107506 - Platform Economy must not have been started.

Recommendation
None

T 6.163 Course: Platform Economy [T-WIWI-107506]

Responsible: Tim Straub
Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101421 - Supply Chain Management

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Exams				
WS 18/19	7900213	Platform Economy	Prüfung (PR)	Weinhardt
WS 18/19	7900214	Platform Economy	Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. Details of the grades will be announced at the beginning of the course.

Prerequisites
None

Recommendation
None

Annotation
New course starting winter term 2017/2018.

T 6.164 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2122376	PLM for product development in mechatronics	SWS	Lecture (V)	Eigner
Exams					
WS 18/19	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, Open in study portal **Lecture (V)**

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

T 6.165 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	2

Events					
WS 18/19	2121357	PLM-CAD Workshop	4 SWS	Seminar / Practical course (S/P)	Ovtcharova, Mitarbeiter
SS 2019	2121357	PLM-CAD Workshop	4 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	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 6.166 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 - Elektrische Energienetze
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each winter term	1

Events					
WS 18/19	2307371	Elektrische Energienetze	2 SWS	Lecture (V)	Leibfried
WS 18/19	2307373	Übungen zu 2307371 Elektrische Energienetze	2 SWS	Practice (Ü)	
Exams					
WS 18/19	7307371	Power Network		Prüfung (PR)	Leibfried
SS 2019	7307371	Power Network		Prüfung (PR)	Leibfried

T 6.167 Course: Practical Seminar Digital Services [T-WIWI-105711]

Responsible: Prof. Dr. Wolf Fichtner
Prof. Dr. Alexander Mädche
Prof. Dr. Stefan Nickel
Prof. Dr. Gerhard Satzger
Prof. Dr. York Sure-Vetter
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-102752 - Fundamentals of Digital Service Systems
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	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 6.168 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-104900 - Betriebswirtschaftslehre
M-WIWI-104911 - Information Systems & Digital Business: Interaction

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	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 6.169 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-104900 - Betriebswirtschaftslehre
M-WIWI-104912 - Information Systems & Digital Business: Platforms

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	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 6.170 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-104900 - Betriebswirtschaftslehre
M-WIWI-104913 - Information Systems & Digital Business: Servitization

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	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 6.171 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2143875	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
WS 18/19	2143877	Introduction to Microsystem Technology - Practical Course	2 SWS	Practical course (P)	Last
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
Exams					
WS 18/19	76-T-MACH-102164	Practical Training in Basics of Microsystem Technology		Prüfung (PR)	Last
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, WS 18/19, 2 SWS, 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 18/19, 2 SWS, 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, SS 2019, 2 SWS, 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, 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 6.172 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 - Strategie und Organisation
M-WIWI-101513 - Personal und Organisation
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	2	Each summer term	1

Events					
SS 2019	2577910	Problem solving, communication and leadership	1 SWS	Lecture (V)	Lindstädt
Exams					
WS 18/19	7900069	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, 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 6.173 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	3	1

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-101638 - Procedures of Remote Sensing, Prerequisite must have been passed.

T 6.174 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	1	Each summer term	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 6.175 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	2

Events					
WS 18/19	2121350	Product Lifecycle Management	2 SWS	Lecture (V)	Ovtcharova
Exams					
WS 18/19	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

2121350, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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 6.176 Course: Product, Process and Resource Integration in the Automotive Industry [T-MACH-102155]

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

Part of: M-MACH-101270 - Product Lifecycle Management

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2123364	Product, Process and Resource Integration in the Automotive Industry	2 SWS	Lecture (V)	Mbang

Competence Certificate
Oral examination 20 min.

Prerequisites
None

Annotation
Limited number of participants.

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

V Product, Process and Resource Integration in the Automotive Industry

2123364, SS 2019, 2 SWS, 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 6.177 Course: Production and Logistics Controlling [T-WIWI-103091]

Responsible: Alexander Rausch
Organisation: KIT Department of Economics and Management
Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2500005	Produktions- und Logistikcontrolling	2 SWS	Lecture (V)	Rausch
Exams					
WS 18/19	79-T-WIWI-103091	Production and Logistics Controlling		Prüfung (PR)	Furmans
SS 2019	79-T-WIWI-103091	Production and Logistics Controlling		Prüfung (PR)	Furmans, Mittwollen

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

Prerequisites
None

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

V Produktions- und Logistikcontrolling

2500005, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Overview of Controlling
2. Performance Measurement
3. Planning
4. Reporting
5. Deviation Analysis

T 6.178 Course: Production Economics and Sustainability [T-WIWI-102820]

Responsible: Dr. Jérémy Rimbon
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101437 - Industrielle Produktion I
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	1

Events					
WS 18/19	2581960	Production Economics and Sustainability	2 SWS	Lecture (V)	Rimbon
Exams					
WS 18/19	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 18/19, 2 SWS, 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 6.179 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Studienleistung	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-101638 - Procedures of Remote Sensing, Prerequisite must have been passed.

T 6.180 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 - Grundlagen des Baubetriebs
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6200106	Projektmanagement [bauiBGP12-PMANG]	2 SWS	Lecture / Practice (VÜ)	Haghsheno, Schneider
Exams					
WS 18/19	8230101675	Project Management		Prüfung (PR)	Haghsheno, Schneider

Competence Certificate
written exam with 60 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 6.181 Course: Public Law I - Basic Principles [T-INFO-101963]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101187 - Recht Wahlpflicht
M-INFO-101192 - Verfassungs- und Verwaltungsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	2

Events					
WS 18/19	24016	Öffentliches Recht I - Grundlagen	2 SWS	Lecture (V)	Marsch
Exams					
WS 18/19	7500051	Public Law I - Basic Principles		Prüfung (PR)	Marsch
SS 2019	7500100	Public Law I - Basic Principles		Prüfung (PR)	Marsch

T 6.182 Course: Public Law II [T-INFO-102042]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101187 - Recht Wahlpflicht
M-INFO-101192 - Verfassungs- und Verwaltungsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	24520	Öffentliches Recht II - Öffentliches Wirtschaftsrecht	2 SWS	Lecture (V)	Marsch
Exams					
WS 18/19	7500052	Public Law II		Prüfung (PR)	Marsch
SS 2019	7500081	Public Law II		Prüfung (PR)	Marsch

T 6.183 Course: Public Media Law [T-INFO-101311]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101217 - Öffentliches Wirtschaftsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	24082	Public Media Law	2 SWS	Lecture (V)	Kirchberg
Exams					
WS 18/19	7500062	Public Media Law		Prüfung (PR)	Dreier, Matz
SS 2019	7500058	Public Media Law		Prüfung (PR)	Dreier, Matz

T 6.184 Course: Public Revenues [T-WIWI-102739]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101403 - Finanzwissenschaft
M-WIWI-101499 - Angewandte Mikroökonomik
M-WIWI-101668 - Wirtschaftspolitik I
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	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					
WS 18/19	790oeff	Public Revenues		Prüfung (PR)	Wigger
SS 2019	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, 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 6.185 Course: Public Sector Finance [T-WIWI-109590]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101403 - Finanzwissenschaft
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2560120	Öffentliches Finanzwesen	3 SWS	Lecture (V)	Wigger, Groh
Exams					
WS 18/19	790oefi	Public Sector Finance		Prüfung (PR)	Wigger
SS 2019	790oefi	Public Sector Finance		Prüfung (PR)	Wigger

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation SPO 2015.

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 Öffentliches Finanzwesen

2560120, WS 18/19, 3 SWS, 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 6.186 Course: Quality Management [T-MACH-102107]

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

Part of: M-MACH-101284 - Vertiefung der Produktionstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	1

Events					
WS 18/19	2149667	Quality Management	2 SWS	Lecture (V)	Lanza
Exams					
WS 18/19	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 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:

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

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-specic elds 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 servicerelated quality management. The content is completed with the presentation of certication 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 6.187 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2586400	Real Estate Management I	2 SWS	Lecture (V)	Lützkendorf
WS 18/19	2586401	Übungen zu Real Estate Management I	2 SWS	Practice (Ü)	Worschech
Exams					
WS 18/19	7900249	Real Estate Management I		Prüfung (PR)	Lützkendorf
WS 18/19	7900250	Real Estate Management I		Prüfung (PR)	Lützkendorf

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

Prerequisites
None

Annotation
The course is replenished by excursions and guest lectures by 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 18/19, 2 SWS, 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 6.188 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
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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

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, 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 6.189 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-101637 - Systems of Remote Sensing, Prerequisite must have been passed.
2. The course T-BGU-101638 - Procedures of Remote Sensing, Prerequisite must have been passed.

Recommendation
None

T 6.190 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 - Energiewirtschaft
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	2

Events					
WS 18/19	2581012	Renewable Energy – Resources, Technologies and Economics	2 SWS	Lecture (V)	McKenna, Jochem
Exams					
WS 18/19	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) according to § 4 paragraph 2 Nr. 1 of the examination regulation SPO2015.

Prerequisites
None.

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

V Renewable Energy – Resources, Technologies and Economics

2581012, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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 6.191 Course: Selected Applications of Technical Logistics [T-MACH-102160]

Responsible: Viktor Milushev
Dr.-Ing. Martin Mittwollen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2118087	Selected Applications of Technical Logistics	3 SWS	Lecture (V)	Mittwollen, Milushev
Exams					
WS 18/19	76-T-MACH-102160	Selected Applications of Technical Logistics		Prüfung (PR)	Mittwollen
SS 2019	76-T-MACH-102160	Selected Applications of Technical Logistics		Prüfung (PR)	Mittwollen

Competence Certificate
The assessment consists of an oral exam (20 min.) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

Recommendation
Knowledge out of Basics of Technical Logistics (T-MACH-102163) / Elements and Systems of Technical Logistics (T-MACH-102159) preconditioned

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

V Selected Applications of Technical Logistics

2118087, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Description
Media:
supplementary sheets,projector, blackboard

Notes
Details according schedule will be published

Learning Content

- design and dimension of machines from intralogistics
- static and dynamic behaviour
- operation properties and specifics
- Inside practical lectures: sample applications and calculations in addition to the lectures

Annotation
Knowledge out of **Basics of Technical Logistics** preconditioned

Workload
presence: 36h

rework: 84h

Literature
Recommendations during lessons

T 6.192 Course: Selected Applications of Technical Logistics - Project [T-MACH-108945]

Responsible: Viktor Milushev
Dr.-Ing. Martin Mittwollen

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	2	Each summer term	1

Competence Certificate
presentation of performed project and defense (30min) according to $4 (2), No. 3 of the examination regulation

Prerequisites
T-MACH-102160 (selected applications of technical logistics) must have been started

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102160 - Selected Applications of Technical Logistics must have been started.

Recommendation
Knowledge out of Basics of Technical Logistics (T-MACH-102163) / Elements and Systems of Technical Logistics (T-MACH-102159) preconditioned

T 6.193 Course: Selected legal issues of Internet law [T-INFO-108462]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-INFO-101307 - Internet Law must not have been started.

T 6.194 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 - Mikrosystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each term	1

Competence Certificate
Oral examination

Prerequisites
none

T 6.195 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 - Seminarmodul
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2151643	Seminar Data Mining in Production	2 SWS	Seminar (S)	Lanza
SS 2019	2151643	Seminar Data Mining in Production	2 SWS	Seminar (S)	Lanza
Exams					
WS 18/19	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, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Description
Media:

KNIME Analytics Platform

Notes
The dates and deadlines for the seminar will be announced at https://www.wbk.kit.edu/studium-und-lehre.php. The number of students is limited to twelve.

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** **Seminar (S)**
2151643, SS 2019, 2 SWS, Open in study portal

Description
Media:

KNIME Analytics Platform

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 6.196 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 - Seminarmodul
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2530372	Investment Case Studies	2 SWS	Seminar (S)	Ulrich
WS 18/19	2530580	Seminar in Finance	2 SWS	Seminar (S)	Uhrig-Homburg, Mitarbeiter
WS 18/19	2540524	Bachelor Seminar in CRM	2 SWS	Seminar (S)	Geyer-Schulz, Ball, Schweigert, Schweizer
WS 18/19	2540557	Literature Review Seminar: Information Systems and Service Design	SWS	Seminar (S)	Mädche, Augenstein
WS 18/19	2545010	Entrepreneurship Basics (Track 1)	2 SWS	Seminar (S)	Schwarzkopf, Terzidis
WS 18/19	2545011	Entrepreneurship Basics (Track 2)	2 SWS	Seminar (S)	Böhrer, Terzidis
WS 18/19	2545012	Entrepreneurship Basics (Track 3)	2 SWS	Seminar (S)	Ziegler, Ntagiakou, Terzidis
WS 18/19	2572173	Seminar in Marketing & Innovation (Bachelor)	SWS	Seminar (S)	Feurer
WS 18/19	2573010	Seminar Human Resources and Organizations	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 18/19	2573011	Seminar Human Resource Management	2 SWS	Seminar (S)	Nieken, Mitarbeiter
WS 18/19	2579905	Special Topics in Management Accounting	2 SWS	Seminar (S)	Riar
WS 18/19	2581976	Seminar in Production and Operations Management I	2 SWS	Seminar (S)	Glöser-Chahoud, Schultmann
WS 18/19	2581977	Seminar in Production and Operations Management II	2 SWS	Seminar (S)	Volk, Schultmann
WS 18/19	2581978	Seminar in Production and Operations Management III	2 SWS	Seminar (S)	Wiens, Schultmann
WS 18/19	2581980	Seminar Energiewirtschaft II	2 SWS	Seminar (S)	Keles
WS 18/19	2581981	Seminar Energiewirtschaft III	2 SWS	Seminar (S)	Ardone
SS 2019	2530293	Seminar in Finance (Bachelor, Prof. Ruckes)	2 SWS	Seminar (S)	Ruckes, Luedecke, Hoang, Scholz-Daneshgari, Strych, Schubert, Benz
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
Exams					
WS 18/19	7500175	Seminar: Energy Informatics		Prüfung (PR)	Wagner
WS 18/19	7900001	Investment Case Studies		Prüfung (PR)	Ulrich
WS 18/19	7900009	Alternative and Big Data in Finance		Prüfung (PR)	Ulrich
WS 18/19	7900017	Seminar Smart Grid and Energy Markets		Prüfung (PR)	Weinhardt
WS 18/19	7900085	Entrepreneurship Basics (Track 1)		Prüfung (PR)	Terzidis
WS 18/19	7900087	Entrepreneurship Basics (Track 2)		Prüfung (PR)	Terzidis
WS 18/19	7900088	Entrepreneurship Basics (Track 3)		Prüfung (PR)	Terzidis
WS 18/19	7900157	Seminar Human Resources and Organizations (Bachelor)		Prüfung (PR)	Nieken
WS 18/19	7900160	Seminar in Marketing und Innovation (Bachelor)		Prüfung (PR)	Feurer
WS 18/19	7900161	Seminar Human Resource Management (Bachelor)		Prüfung (PR)	Nieken
WS 18/19	7900165	Seminar Digital Experience and Participation		Prüfung (PR)	Weinhardt
WS 18/19	7900168	Bachelor Seminar in CRM		Prüfung (PR)	Geyer-Schulz
WS 18/19	7900175	Seminar in Finance (Bachelor)		Prüfung (PR)	Uhrig-Homburg
WS 18/19	7900203	Seminar in Finance		Prüfung (PR)	Uhrig-Homburg
WS 18/19	7900233	Literature Review Seminar: Information Systems and Service Design (Seminar)		Prüfung (PR)	Mädche
WS 18/19	7900265	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900283	Seminar Electronic Markets and User Behavior		Prüfung (PR)	Weinhardt
WS 18/19	7900285	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Lützkendorf
WS 18/19	79-2579905-01	Special Topics in Management Accounting (Bachelor)		Prüfung (PR)	Wouters
WS 18/19	7981976	Seminar in Production and Operations Management I		Prüfung (PR)	Schultmann
WS 18/19	7981977	Seminar in Production and Operations Management II		Prüfung (PR)	Schultmann
WS 18/19	7981978	Seminar in Production and Operations Management III		Prüfung (PR)	Schultmann
WS 18/19	7981979	Seminar in Business Administration A (Master)		Prüfung (PR)	Fichtner
WS 18/19	7981980	Seminar in Business Administration A (Master)		Prüfung (PR)	Fichtner
WS 18/19	7981981	Seminar in Business Administration (Bachelor)		Prüfung (PR)	Fichtner
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	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

Competence Certificate
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

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 **Bachelor Seminar in CRM** **Seminar (S)**
2540524, WS 18/19, 2 SWS, Open in study portal

Learning Content
This seminar serves as an introduction into the process of scientific work. As a consequence, four (mandatory) introductory lessons are given that will give insight to philosophy of science, researching literature, typesetting with LaTeX and writing/ presenting of content.

The seminar roughly treats questions of Customer Relationship Management. Exact topics are announced with the beginning of the application period.

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 18/19, 2 SWS, Open in study portal

Annotation
Please register on the seminar website.

V Seminar in Marketing & Innovation (Bachelor)
2572173, WS 18/19, SWS, Open in study portal — **Seminar (S)**

Learning Content
The seminary teaches students to gain a systematic overview of a field of literature in Marketing - an important prerequisite for a successful thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, and writing comprehensively.

Annotation
Students interested in thesis positions at the chair of marketing should participate in the marketing seminar. For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu)

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

Literature
will be announced in the seminary

V Seminar Human Resources and Organizations
2573010, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.

Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Seminar Human Resource Management
2573011, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

Workload
The total workload for this course is approximately 90 hours.

Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Special Topics in Management Accounting
2579905, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

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 Finance (Master, Prof. Uhrig-Homburg)
2530580, SS 2019, 2 SWS, 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)**

Learning Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.

Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

V Seminar Human Resource Management (Bachelor)
2573011, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Chair.

Workload
The total workload for this course is approximately 90 hours.

Lecture 30h
Preparation of lecture 45h
Exam preparation 15h

Literature
Selected journal articles and books.

V Seminar Management Accounting
2579904, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

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, Open in study portal

Seminar (S)

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.

T 6.197 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 - Seminarmodul
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	3 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Ott, Weller, Bälz
WS 18/19	2520405	Topics in Experimental Economics	SWS	Seminar (S)	Reiß, Hofmann, Mitarbeiter
WS 18/19	2521310	Topics in Econometrics	2 SWS	Seminar (S)	Buse, Görgen
WS 18/19	2560140	Topics on Political Economics	2 SWS	Seminar (S)	Szech, Engel
WS 18/19	2560141	Morals & Social Behavior	2 SWS	Seminar (S)	Szech, Huber
WS 18/19	2560400	Seminar in Macroeconomics	2 SWS	Seminar (S)	Brumm, Krause, Pegorari
WS 18/19	2561208	Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung	1 SWS	Seminar (S)	Szimba
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
Exams					
WS 18/19	7900094	Selected Topics in Text Mining - Cooperation Seminar AIFB and ECON		Prüfung (PR)	Sure-Vetter, Ott
WS 18/19	7900132	Seminar in Economics A (Master)		Prüfung (PR)	Fuchs-Seliger
WS 18/19	7900139	Seminar in Economics (Bachelor/Master)		Prüfung (PR)	Mitusch
WS 18/19	7900141	Seminar on Voting Theory		Prüfung (PR)	Puppe
WS 18/19	7900216	Seminar in Macroeconomics		Prüfung (PR)	Brumm
WS 18/19	7900254	Topics in Econometrics. Seminar in Economics (Bachelor)		Prüfung (PR)	Schienle
WS 18/19	7900257	Date Mining		Prüfung (PR)	Nakhaeizadeh
WS 18/19	7900278	Seminar on Morals and Social Behavior		Prüfung (PR)	Szech
WS 18/19	7900282	Seminar in Political Economics (Bachelor)		Prüfung (PR)	Szech
WS 18/19	79191ee	Seminar Topics in Experimental Economics		Prüfung (PR)	Reiß
WS 18/19	79sefi1	Seminar in Economics (Bachelor)		Prüfung (PR)	Wigger
SS 2019	7900130	Seminar in Economics (Bachelor)		Prüfung (PR)	Szech
SS 2019	7900131	Seminar in Economics (Bachelor)		Prüfung (PR)	Szech
SS 2019	79sefi1	Seminar in Economics (Bachelor)		Prüfung (PR)	Wigger

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

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 **Cooperation seminar: Innovative applications on single board computers as well as their economic relevance** **Seminar / Practical course (S/P)**
2512312, WS 18/19, 3 SWS, Open in study portal

Description
This seminar is offered cooperatively by the Chair of Web Science (AIFB) and the Chair of Economic Policy (ECON).

The cooperation seminar deals with the technical realization of innovative applications using single board computers such as Arduino (https://www.arduino.cc) or Raspberry Pi (https://www.raspberrypi.org). These single board computers can be extended by various sensors and modules, thus fulfilling a wide range of tasks. Thus, the addition of a camera allows for example gesture and face detection, or the equipment with different sensors enables the measurement of temperature and perception of moving objects.

At the same time, the implications of cost-effective availability of these basic technologies are analyzed from an economic-scientific perspective. The spread and use of these single-board computers, as well as the concepts associated with their success, can have a decisive impact on innovation processes. The reasons and obstacles as well as their relevance to innovation are therefore also addressed from an economic perspective.

Microcomputers such as the Raspberry Pi, for example, are increasingly being used and expanded in the private environment, with numerous applications being possible in the household sector. They can be used as a monitoring system, as a home server or as an electronic func- tion opener. Likewise, due to their low cost, size and ease of use, they can also significantly support the development of innovative processes, for example in the development of prototypes.

Within the scope of this seminar, the possibilities of a single board computer are investigated using the Raspberry Pi. The students are to conceive, realize and present innovative applications in two-teams. Each team is provided with a Raspberry Pi. In addition to the realization of an innovative application, each team has to deal with and discuss an economic science issue. The use of the Raspberry Pi or the underlying concepts from an innovation-economic perspective are to be analyzed.

In addition to the Raspberry Pis, various sensors and expansion modules are also provided and can be purchased after consultation with the supervisors. Furthermore, it may be necessary to develop extensions in Python during the seminar. Previous knowledge in Python and Semantic Web technologies are therefore an advantage but not an imperative requirement.

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

Learning Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Topics in Experimental Economics
2520405, WS 18/19, SWS, Open in study portal **Seminar (S)**

Learning Content
The course covers selected topics in experimental economics and deepens the understanding of the experimental method. In particular, topics of current research into experimental and behavioral economics are discussed, along with a treatment of advanced methodic issues.

Annotation
The course is offered in summer 2016 for the first time. The course is not offered in every academic year.

Workload
The total workload for this course is approximately 90.0 hours. For further information see German version.

Literature
A selection of published papers is compulsory reading for the course. The course syllabus provides references and is announced at the beginning of the course.

V Topics in Econometrics
2521310, WS 18/19, 2 SWS, 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
2560140, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Workload
About 90 hours.

V Topics in Political Economics (Bachelor)
2560553, SS 2019, 2 SWS, 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)

Seminar (S)

2560555, SS 2019, 2 SWS, Open in study portal

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.

T 6.198 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 - Seminarmodul
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Exams				
WS 18/19	7311633	Seminar Creating a Patent Specification	Prüfung (PR)	Stork
WS 18/19	8245100014	Seminar in Transportation	Prüfung (PR)	Vortisch, Chlond
SS 2019	76-T-MACH-00002	Seminar for Rail System Technology	Prüfung (PR)	Gratzfeld

Competence Certificate
See German version.

Prerequisites
See module description.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-103147 - Seminar in Engineering Science (Master) must not have been started.
2. The course T-WIWI-102755 - Seminar in Engineering Science (Bachelor) must not have been started.

Recommendation
None

T 6.199 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 - Seminarmodul
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2512301	Linked Data and the Semantic Web	3 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Acosta Deibe, Käfer, Heling, Weller
WS 18/19	2512311	Real-World Challenges in Data Science and Analytics	3 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Nickel, Weinhardt, Zehnder, Brandt
WS 18/19	2512312	Cooperation seminar: Innovative applications on single board computers as well as their economic relevance	3 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Ott, Weller, Bälz
WS 18/19	2513200	Seminar Betriebliche Informationssysteme: Programmieren 3 (Bachelor)	2 SWS	Seminar (S)	Oberweis, Zöllner, Drescher, Fritsch, Struppek
WS 18/19	2513400	Emerging Trends in Critical Information Infrastructures	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
WS 18/19	2595470	Seminar Service Science, Management & Engineering	2 SWS	Seminar (S)	Weinhardt, Satzger, Nickel, Fromm, Fichtner, Sure-Vetter
SS 2019	2512300	Knowledge Discovery and Data Mining	3 SWS	Seminar / Practical course (S/P)	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	Seminar / Practical course (S/P)	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
Exams					
WS 18/19	7500175	Seminar: Energy Informatics		Prüfung (PR)	Wagner
WS 18/19	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 18/19	7900042	Seminar Betriebliche Informationssysteme: Programmieren 3		Prüfung (PR)	Oberweis
WS 18/19	7900044	Seminar Service Science, Management & Engineering		Prüfung (PR)	Sure-Vetter
WS 18/19	7900094	Selected Topics in Text Mining - Cooperation Seminar AIFB and ECON		Prüfung (PR)	Sure-Vetter, Ott
WS 18/19	7900114	Emerging Trends in Critical Information Infrastructures		Prüfung (PR)	Sunyaev
WS 18/19	7900121	Seminar "Privacy Awareness"		Prüfung (PR)	Volkamer

WS 18/19	7900192	Data Science with Open Data	Prüfung (PR)	Sure-Vetter
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

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

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 **Linked Data and the Semantic Web** **Seminar / Practical course (S/P)**
2512301, WS 18/19, 3 SWS, Open in study portal

Description
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'.

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

Learning Content
Topics of interest include, but are not limited to:

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

V Real-World Challenges in Data Science and Analytics

2512311, WS 18/19, 3 SWS, Open in study portal

Seminar / Practical course (S/P)

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

V Cooperation seminar: Innovative applications on single board computers as well as their economic relevance

2512312, WS 18/19, 3 SWS, Open in study portal

Seminar / Practical course (S/P)

Description
This seminar is offered cooperatively by the Chair of Web Science (AIFB) and the Chair of Economic Policy (ECON).

The cooperation seminar deals with the technical realization of innovative applications using single board computers such as Arduino (https://www.arduino.cc) or Raspberry Pi (https://www.raspberrypi.org). These single board computers can be extended by various sensors and modules, thus fulfilling a wide range of tasks. Thus, the addition of a camera allows for example gesture and face detection, or the equipment with different sensors enables the measurement of temperature and perception of moving objects.

At the same time, the implications of cost-effective availability of these basic technologies are analyzed from an economic-scientific perspective. The spread and use of these single-board computers, as well as the concepts associated with their success, can have a decisive impact on innovation processes. The reasons and obstacles as well as their relevance to innovation are therefore also addressed from an economic perspective.

Microcomputers such as the Raspberry Pi, for example, are increasingly being used and expanded in the private environment, with numerous applications being possible in the household sector. They can be used as a monitoring system, as a home server or as an electronic func- tion opener. Likewise, due to their low cost, size and ease of use, they can also significantly support the development of innovative processes, for example in the development of prototypes.

Within the scope of this seminar, the possibilities of a single board computer are investigated using the Raspberry Pi. The students are to conceive, realize and present innovative applications in two-teams. Each team is provided with a Raspberry Pi. In addition to the realization of an innovative application, each team has to deal with and discuss an economic science issue. The use of the Raspberry Pi or the underlying concepts from an innovation-economic perspective are to be analyzed.

In addition to the Raspberry Pis, various sensors and expansion modules are also provided and can be purchased after consultation with the supervisors. Furthermore, it may be necessary to develop extensions in Python during the seminar. Previous knowledge in Python and Semantic Web technologies are therefore an advantage but not an imperative requirement.

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

Learning Content
Topics of interest include, but are not limited to:

- Smart Home Applications
- Environmental measurements
- Gesture control
- Security systems

V Emerging Trends in Critical Information Infrastructures

2513400, WS 18/19, 2 SWS, Open in study portal

Seminar (S)

Description
The block seminar Emerging Trends in Critical Information Infrastructures aims to provide insights into emerging topics in the field of information systems and to offer students an opportunity to write their first academic paper alone or in a group of students. Each semester, different topics are offered around the lectures and research domains of Prof. Sunyaev's chair, especially Trusted Engineering, Digital Health, Internet Technologies as well as Auditing and Certifications. Students can also submit their own topic suggestions within the framework of the main topics specified in the respective semester.

V Seminar Service Science, Management & Engineering

2595470, WS 18/19, 2 SWS, Open in study portal

Seminar (S)

Learning Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

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

Literature
The student will receive the necessary literature for his research topic.

V Knowledge Discovery and Data Mining

2512300, SS 2019, 3 SWS, Open in study portal

Seminar / Practical course (S/P)

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, Open in study portal

Seminar / Practical course (S/P)

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

2595470, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Learning Content
Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

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.

T 6.200 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 - Seminarmodul
M-WIWI-104905 - Mathematik

Type	Credits	Version
Prüfungsleistung anderer Art	3	1

T 6.201 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 - Seminarmodul
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2550131	Seminar zu Methodische Grundlagen des Operations Research (BA)	SWS	Seminar (S)	Stein, Mohr, Neumann
WS 18/19	2550491	Seminar: Recent Topics in OR	SWS	Seminar (S)	Nickel, Mitarbeiter
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
Exams					
WS 18/19	7900216_WS1819	Seminar in Operations Research (Bachelor)		Prüfung (PR)	Stein
WS 18/19	7900262	Seminar in Operations Research (Bachelor)		Prüfung (PR)	Nickel
SS 2019	7900017_SS2019	Seminar in Operations Research (Bachelor)		Prüfung (PR)	Stein

Competence Certificate
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015)consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

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 zu Methodische Grundlagen des Operations Research (BA)

2550131, WS 18/19, SWS, 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: Recent Topics in OR

2550491, WS 18/19, SWS, 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.

V Seminar zur diskreten Optimierung

2550491, SS 2019, SWS, 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.

T 6.202 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 - Seminarmodul
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2521310	Topics in Econometrics	2 SWS	Seminar (S)	Buse, Görgen

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- a talk about the research topic of the seminar together with discussion,
- a written summary about the major issues of the topic and
- attending the discussions of the seminar

The grade is achieved by the weighted sum of the grades.

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 18/19, 2 SWS, Open in study portal **Seminar (S)**

Annotation
In the winter semester 2018/19 the course will be held in English.

T 6.203 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 - Seminarmodul
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
SS 2019	2149665	Seminar Production Technology	1 SWS	Seminar (S)	Fleischer, Lanza, Schulze, Zanger
Exams					
WS 18/19	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

2149665, SS 2019, 1 SWS, Open in study portal — **Seminar (S)**

Description
The specific topics are published on the homepage of the wbk Institute of Production Science.

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 6.204 Course: Seminar: Legal Studies I [T-INFO-101997]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-WIWI-101816 - Seminarmodul
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	24389	IT-Sicherheit und Recht	2 SWS	Seminar (S)	Schallbruch
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
Exams					
WS 18/19	7500035	Seminar: Legal Studies II		Prüfung (PR)	Marsch
WS 18/19	7500182	Seminar: Legal Studies II		Prüfung (PR)	Raabe, Dreier, 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 6.205 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 - Grundlagen des Marketing
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2572158	Services Marketing and B2B Marketing	2 SWS	Lecture (V)	Klarmann
Exams					
WS 18/19	7900081	Services Marketing and B2B Marketing		Prüfung (PR)	Klarmann, Kim
WS 18/19	7900126	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 18/19, 2 SWS, 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 6.206 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 - Soziologie/Empirische Sozialforschung
M-WIWI-104906 - Geistes- und Sozialwissenschaften

Type	Credits	Recurrence	Version
Studienleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	5011011	Sozialforschung: Ökonomische Ungleichheit	2 SWS	Seminar (S)	Binder
WS 18/19	5011014	Sozialforschung: Schöne neue Arbeitswelt?" Erwerbstätigkeit in Deutschland: früher, heute und in Zukunft	SWS	Seminar (S)	Ebner
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
Exams					
WS 18/19	7400041	Social Science A (WiWi)		Prüfung (PR)	Nollmann

T 6.207 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 - Soziologie/Empirische Sozialforschung
M-WIWI-104906 - Geistes- und Sozialwissenschaften

Type	Credits	Recurrence	Version
Studienleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	5011011	Sozialforschung: Ökonomische Ungleichheit	2 SWS	Seminar (S)	Binder
WS 18/19	5011014	Sozialforschung: Schöne neue Arbeitswelt?" Erwerbstätigkeit in Deutschland: früher, heute und in Zukunft	SWS	Seminar (S)	Ebner
Exams					
WS 18/19	7400046	Social Science B (WiWi)		Prüfung (PR)	Nollmann

T 6.208 Course: Software Engineering [T-WIWI-100809]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	2

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 18/19	7900026	Software Engineering		Prüfung (PR)	Oberweis
SS 2019	7900027	Software Engineering		Prüfung (PR)	Oberweis

Competence Certificate
The assessment consists of an 1h written exam in the first week after lecture period.

Prerequisites
None

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

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

V Software Engineering

2511206, SS 2019, 2 SWS, 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 6.209 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 und Service Management
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	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 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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102706 - Special Topics in Information Engineering & Management must not have been started.

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 6.210 Course: Special Topics of Applied Informatics [T-WIWI-102910]

Responsible: Prof. Dr. Andreas Oberweis
Prof. Dr. Harald Sack
Prof. Dr. Ali Sunyaev
Prof. Dr. York Sure-Vetter
Prof. Dr. Melanie Volkamer
Prof. Dr.-Ing. Johann Marius Zöllner

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each term	4

Exams				
WS 18/19	7900066	Interdisciplinary Approach to Verifiable E-Voting	Prüfung (PR)	Volkamer

Competence Certificate
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.
Depending on the particular course associated with this placeholder a bonus on the examination grade is possible.

Prerequisites
None

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-WIWI-101581 - Introduction to Programming must have been passed.
2. The module M-WIWI-101417 - Foundations of Informatics must have been passed.

Annotation
This course can be used in particular for the acceptance of external courses whose content is in the broader area of applied informatics, but is not equivalent to another course of this topic.

T 6.211 Course: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

Responsible: Dr. Wolf-Dieter Heller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101420 - Ökonometrie und VWL
M-WIWI-101599 - Statistik und Ökonometrie
M-WIWI-101608 - Statistik und Ökonometrie
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2521350	Statistische Modellierung von Allgemeinen Regressionsmodellen	2 SWS	Lecture (V)	Heller
Exams					
WS 18/19	7900146	Statistical Modeling of generalized regression models		Prüfung (PR)	Heller

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

Prerequisites
None

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

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

V Statistische Modellierung von Allgemeinen Regressionsmodellen

2521350, WS 18/19, 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 6.212 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 - Einführung in die Statistik
M-WIWI-101726 - Orientierungsprüfung
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	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					
WS 18/19	7900140	Statistics I		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

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

V Statistics I

2600008, SS 2019, 4 SWS, 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 6.213 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 - Einführung in die Statistik
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2610020	Statistics II	4 SWS	Lecture (V)	Grothe
WS 18/19	2610021	Tutorien zu Statistik II	2 SWS	Tutorial (Tu)	Grothe, Rüter, Bitzer
WS 18/19	2610022	PC-Praktikum zu Statistik II	2 SWS	Practice (PÜ)	Grothe, Rüter, Bitzer
Exams					
WS 18/19	7900217	Statistics II		Prüfung (PR)	Grothe
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 18/19, 4 SWS, 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 6.214 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 - Einführung in Naturgefahren und Risikoanalysen 1
M-WIWI-101648 - Einführung in Naturgefahren und Risikoanalysen 2
M-WIWI-104838 - Einführung in Naturgefahren und Risikoanalysen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	1	Each summer term	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 6.215 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 - Anwendungen des Operations Research
M-WIWI-101421 - Supply Chain Management
M-WIWI-103278 - Optimierung unter Unsicherheit
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	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					
WS 18/19	7900220	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, 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 6.216 Course: Tax Law I [T-INFO-101315]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101216 - Recht der Wirtschaftsunternehmen
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	24168	Tax Law I	2 SWS	Lecture (V)	Dietrich
Exams					
WS 18/19	7500066	Tax Law I		Prüfung (PR)	Dreier, Matz
SS 2019	7500052	Tax Law I		Prüfung (PR)	Dreier, Matz

T 6.217 Course: Tax Law II [T-INFO-101314]

Responsible: Detlef Dietrich
Prof. Dr. Thomas Dreier

Organisation: KIT Department of Informatics

Part of: M-INFO-101216 - Recht der Wirtschaftsunternehmen
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	24646	Tax Law II	2 SWS	Lecture (V)	Dietrich
Exams					
WS 18/19	7500067	Tax Law II		Prüfung (PR)	Dreier, Matz
SS 2019	7500053	Tax Law II		Prüfung (PR)	Dreier, Matz

T 6.218 Course: Telecommunications Law [T-INFO-101309]

Responsible: Prof. Dr. Nikolaus Marsch
Organisation: KIT Department of Informatics
Part of: M-INFO-101217 - Öffentliches Wirtschaftsrecht
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	24632	Telekommunikationsrecht	2 SWS	Lecture (V)	Hermstrüwer
Exams					
WS 18/19	7500049	Telecommunications Law		Prüfung (PR)	Marsch
SS 2019	7500085	Telecommunications Law		Prüfung (PR)	Marsch

T 6.219 Course: Trademark and Unfair Competition Law [T-INFO-101313]

Responsible: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: M-INFO-101215 - Recht des Geistigen Eigentums
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	24136	Trademark and Unfair Competition Law	2 SWS	Lecture (V)	Matz
Exams					
WS 18/19	7500061	Trademark and Unfair Competition Law		Prüfung (PR)	Dreier, Matz
SS 2019	7500051	Trademark and Unfair Competition Law		Prüfung (PR)	Dreier, Matz

T 6.220 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
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	2

Events					
WS 18/19	2123375	Virtual Reality Practical Course	3 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	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 18/19, 3 SWS, 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 6.221 Course: Visual Computing [T-WIWI-110108]

Responsible: Dr. Tatiana Landesberger von Antburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101399 - Vertiefung Informatik
M-WIWI-101426 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Once	1

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 6.222 Course: Warehousing and Distribution Systems [T-MACH-105174]

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

Part of: M-MACH-101269 - Einführung in die Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	2118097	Warehousing and distribution systems	2 SWS	Lecture (V)	Furmans
Exams					
WS 18/19	76-T-MACH-105174	Warehousing and Distribution Systems		Prüfung (PR)	Furmans, Mittwollen
SS 2019	76-T-MACH-105174	Warehousing and Distribution Systems		Prüfung (PR)	Furmans

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

Prerequisites
none

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

V Warehousing and distribution systems

2118097, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations, black board

Learning Content

- Introduction
- Yard management
- Receiving
- Storage and picking
- Workshop on cycle times
- Consoldiation and packing
- Shipping
- Added Value
- Overhead
- Case Study: DCRM
- Planning of warehouses
- Case study: Planning of warehouses
- Distribution networks
- Lean Warehousing

Annotation
none

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

Literature

ARNOLD, Dieter, FURMANS, Kai (2005)
Materialfluss in Logistiksystemen, 5. Auflage, Berlin: Springer-Verlag

ARNOLD, Dieter (Hrsg.) et al. (2008)
Handbuch Logistik, 3. Auflage, Berlin: Springer-Verlag

BARTHOLDI III, John J., HACKMAN, Steven T. (2008)
Warehouse Science

GUDEHUS, Timm (2005)
Logistik, 3. Auflage, Berlin: Springer-Verlag

FRAZELLE, Edward (2002)
World-class warehousing and material handling, McGraw-Hill

MARTIN, Heinrich (1999)
Praxiswissen Materialflußplanung: Transport, Hanshaben, Lagern, Kommissionieren, Braunschweig, Wiesbaden: Vieweg

WISSER, Jens (2009)
Der Prozess Lagern und Kommissionieren im Rahmen des Distribution Center Reference Model (DCRM); Karlsruhe : Universitätsverlag

A comprehensive overview of scientific papers can be found at:

ROODBERGEN, Kees Jan (2007)
Warehouse Literature

T 6.223 Course: Welfare Economics [T-WIWI-102610]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101501 - Wirtschaftstheorie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	2

Events					
SS 2019	2520517	Welfare Economics	SWS	Lecture (V)	Puppe, Rollmann
SS 2019	2520518	Übung zur Wohlfahrtstheorie	SWS	Practice (Ü)	Puppe, Rollmann

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.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102708 - Economics I: Microeconomics must have been passed.
2. The course T-WIWI-102709 - Economics II: Macroeconomics must have been passed.

Recommendation
None

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

V Welfare Economics

2520517, SS 2019, SWS, 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 competetive 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 6.224 Course: Wildcard eBusiness and Service Management [T-WIWI-109808]

Organisation: University
Part of: M-WIWI-101434 - eBusiness und Service Management

Type	Credits	Version
Prüfungsleistung anderer Art	4,5	1

T 6.225 Course: Wildcard Supply Chain Management [T-WIWI-109802]

Organisation: University
Part of: M-WIWI-101421 - Supply Chain Management

Type	Credits	Version
Prüfungsleistung anderer Art	4,5	1

T 6.226 Course: Wildcard Supply Chain Management [T-WIWI-109803]

Organisation: University
Part of: M-WIWI-101421 - Supply Chain Management

Type	Credits	Version
Prüfungsleistung anderer Art	4,5	1