Karlsruher Institut für Technologie

Module Handbook
Industrial Engineering and Management M.Sc.

SPO 2015

Summer term 2019

Date: 01.04.2019

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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Write to us!

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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 Why Industrial Engineering and Management?

The Industrial Engineering and Management study programme is attractive for you if you want to pursue economic and technical interests during your studies. There are three main reasons why graduates have huge job opportunities:

That speaks (among other things) for the course of studies:

- Germany is a high-tech country that depends on innovation. Anyone who wants to take on responsibility in a company here benefits from an interdisciplinary course of study in economics and technology.
- In the digital society, the distinction between technical and business issues is becoming blurred. Industrial engineers understand both and can therefore assume important interface functions.
- Data and data-based decisions are becoming increasingly important in companies and research. The Industrial Engineering and Management study programme has a strong quantitative-methodological orientation and thus prepares students perfectly for these tasks.

You can find more information about the program here:

https://ranking.zeit.de/che/de/fachinfo/13
http://www.tu9.de/studium/2982.php

Why Industrial Engineering and Management at KIT? There are some universities in Germany where you can study Industrial Engineering and Management very well. In comparison, studying with us has three important advantages:

- **Flexibility** If you are study Industrial Engineering and Management at KIT, you can tailor your course content to suit your individual needs. At the beginning of your studies, you do not yet decide on a technical subject. First of all, our compulsory courses in the basic programme offer you a broad overview. In the subsequent specialisation programme, you can choose the course content in the technical subjects and economics according to your own interests and goals. Link to the module manual
- **High Informatics share** Digitisation permeates all sectors of the economy and technology. For this reason, Informatics content is particularly anchored in both our basic and advanced programs. As a graduate, you can play an active role in the digital transformation of business and society.
- **Our own faculty** The Industrial Engineering and Management study programme is the core course of studies at the KIT department of Economics. The courses in economics and Informatics are designed for your course of studies and aligned to your interests.

What else speaks for an Industrial Engineering and Management study programme at KIT? These three advantages make the Industrial Engineering and Management study programme at KIT unique. In addition, there are a number of other reasons for studying with us:

- **Top positions in rankings**. In surveys of students and HR managers at companies, our degree programme regularly scores very well.
- **Job opportunities**. After completing their studies with us, students usually quickly find a job that they like.
- **Found your own business**. At KIT you will find an ideal environment for starting your own business. Information on start-up activities at KIT can be found at http://kit-gruenderschmiede.de/de/gruenderschmiede/fuer-studierende/
- **Student activities**. At our faculty and at the KIT, students are committed to themselves and others in a variety of ways. You can find an overview under Student Life at the Department, for example.
- **Sports Offer**. At KIT you will find a wide range of sports activities. Examples are the KIT SC (kitsc.de/ External Link) and the University Sports Programme (www.sport.kit.edu/hochschulsport/ External Link). Campus University. The KIT has a large campus directly in the city centre of Karlsruhe.

4 The Master’s degree program in Industrial Engineering and Management

4.1 Qualification objectives of the Master's program in Industrial Engineering and Management

Graduates of the interdisciplinary Master's program in Industrial Engineering have advanced and in-depth knowledge in business administration, economics, computer science, operations research and engineering. This mainly has its focus on business administration and engineering. The areas of specialization depend on individual interests. Additional knowledge in statistics, law or sociology is also offered depending on one's interests.

They have generalized or specialized expertise in the different disciplines.

The graduates are in a position to define, describe and interpret the specifics, limits, terminologies and doctrines in these subjects, reproduce the current state of research and selectively use this as a basis for further development.

Their extensive know-how enables them to think across the various disciplines and approach issues from different angles.

They are able to select and combine appropriate courses of action for research-related topics. They can then transfer and apply these to specific problems.

They can separately analyze extensive problems such as information and current challenges and review, compare and evaluate these using appropriate methods and concepts.

They evaluate the complexity and risks, identify improvement potentials and choose sustainable solution processes and improvement methods. This puts them in a position where they are able to make responsible and science-based decisions. They are able to come up with innovative ideas and apply them accordingly.

They can oversee these approaches either independently or in teams. They are able to explain and discuss their decisions. They can independently interpret, validate and illustrate the obtained results.

The interdisciplinary use of knowledge also takes account of social, scientific and ethical insights. The graduates can communicate with expert representatives on a scientific level and assume prominent responsibility in a team.

Karlsruhe's industrial engineers are characterized by their interdisciplinary thinking as well as their innovation and management capability. They are particularly qualified for industrial occupations, service sector or in public administration as well as a downstream scientific career (PhD).

4.2 Structure of the Master’s degree program in Industrial Engineering and Management (M.Sc.) SPO 2015

The Master’s degree program in Industrial Engineering and Management (M.Sc.) has 4 terms and consists of 120 credits (CP) including Master's thesis. The master programme further deepens or complements the scientific qualifications acquired in the bachelor programme. The students should be made capable of independently applying scientific knowledge and methods and evaluate their implications and scope concerning solutions of complex scientific and social problems.

Furthermore, the student has to attend two seminars with a minimum of six CP within the seminar module. In addition to the key skills gained in the seminars (3 CP), the student has to acquire additional key skills totalling at least 3 credits.

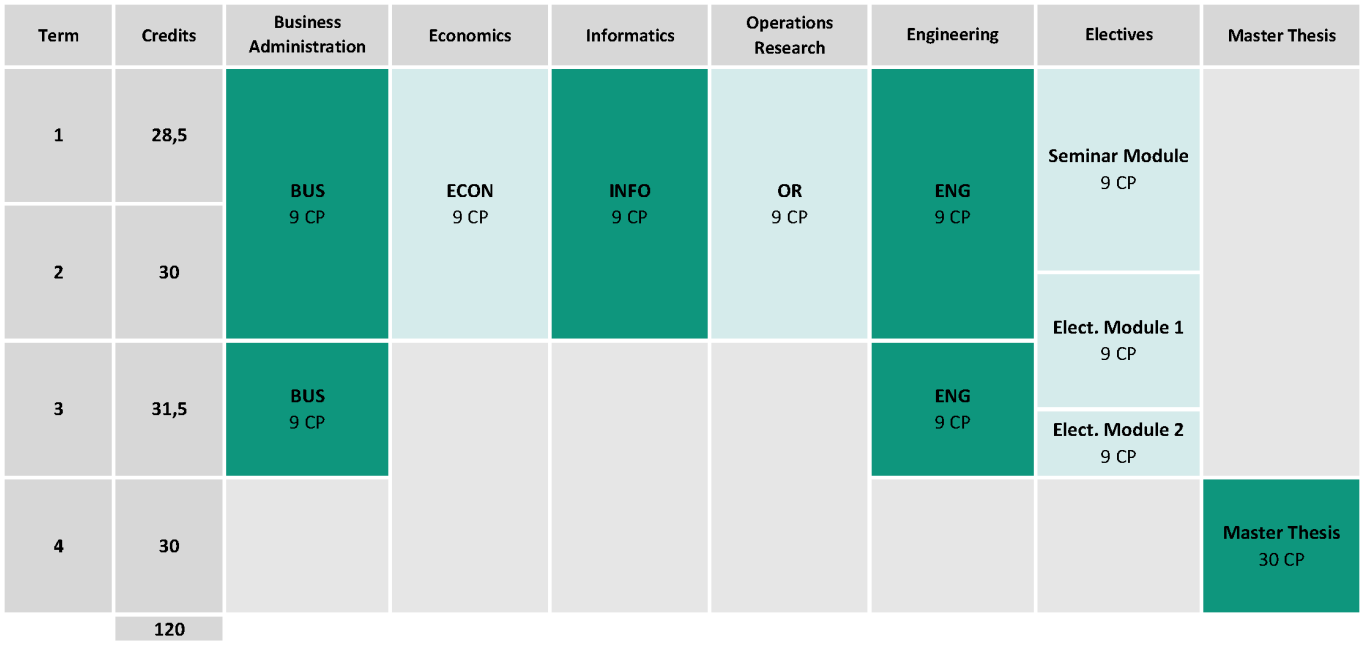

Figure 2: Structure of the Master Programme SPO2015 (Recommendation)

Figure 2 shows the structure of the subjects and the credits allocated to the subjects. The student has to choose two elective modules of the following disciplines: Business science, economics, informatics, operations research, engineering science, statistics, law and sociology. In principle, both elective modules are also available in one discipline. Thereby it is it is only allowed to choose either one module in law or in sociology.

It is left to the student's individual curriculum (taking into account the examination and module regulations), in which terms the chosen modules will be started and completed. However, it is highly recommended to complete all courses and seminars before beginning the Master's thesis.

4.3 Key Skills

The master program Industrial Engineering and Management (M.Sc.) at the KIT 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. Furthermore, the seminar courses in the master degree programme contribute significantly to the development of key skills by practicing to elaborate and write scientifically sound papers and presentations about special topics. 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 obligatory courses during the master programme, namely

- Seminar module
- Mentoring of the Master's thesis
- Business science, economics and informatics modules

Besides the integrated key skills, the additive acquisition of key skills, which are totalling at least three credits within the seminar module, is scheduled. Students may choose freely among the offered courses of HoC, ZAK and Sprachenzenrtum.

5 Field of study structure

Mandatory	
Master Thesis	30 CR
Business Administration	18 CR
Economics	9 CR
Informatics	9 CR
Operations Research	9 CR
Engineering Sciences	18 CR
Compulsory Elective Modules	27 CR

5.1 Master Thesis

Credits
30

Mandatory		
M-WIWI-101650	Module Master Thesis	30 CR

5.2 Business Administration

Credits
18

Election block: Betriebswirtschaftslehre (2 items)		
M-WIWI-101410	Business & Service Engineering	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101510	Cross-Functional Management Accounting	9 CR
M-WIWI-101470	Data Science: Advanced CRM	9 CR
M-WIWI-103117	Data Science: Data-Driven Information Systems	9 CR
M-WIWI-103118	Data Science: Data-Driven User Modeling	9 CR
M-WIWI-101647	Data Science: Evidence-based Marketing	9 CR
M-WIWI-104080	Designing Interactive Information Systems	9 CR
M-WIWI-103261	Disruptive FinTech Innovations	9 CR
M-WIWI-103720	eEnergy: Markets, Services and Systems	9 CR
M-WIWI-101409	Electronic Markets	9 CR
M-WIWI-101451	Energy Economics and Energy Markets	9 CR
M-WIWI-101452	Energy Economics and Technology	9 CR
M-WIWI-101488	Entrepreneurship (EnTechnon)	9 CR
M-WIWI-101482	Finance 1	9 CR
M-WIWI-101483	Finance 2	9 CR
M-WIWI-101480	Finance 3	9 CR
M-WIWI-101508	Real Estate Economics and Sustainability	9 CR
M-WIWI-101471	Industrial Production II	9 CR
M-WIWI-101412	Industrial Production III	9 CR
M-WIWI-101411	Information Engineering	9 CR
M-WIWI-104068	Information Systems in Organizations	9 CR
M-WIWI-101507	Innovation Management	9 CR
M-WIWI-101449	Insurance Management II	9 CR
M-WIWI-103247	Intelligent Risk and Investment Advisory	9 CR
M-WIWI-101446	Market Engineering	9 CR
M-WIWI-101490	Marketing Management	9 CR
M-WIWI-101487	Sales Management	9 CR
M-WIWI-101506	Service Analytics	9 CR
M-WIWI-101503	Service Design Thinking	9 CR
M-WIWI-102754	Service Economics and Management	9 CR
M-WIWI-102806	Service Innovation, Design & Engineering	9 CR
M-WIWI-101448	Service Management	9 CR
M-WIWI-103119	Advanced Topics in Strategy and Management	9 CR

5.3 Economics

Credits
9

Election block: Volkswirtschaftslehre (1 item)		
M-WIWI-101497	Agglomeration and Innovation	9 CR
M-WIWI-101453	Applied Strategic Decisions	9 CR
M-WIWI-101504	Collective Decision Making	9 CR
M-WIWI-101505	Experimental Economics	9 CR
M-WIWI-101514	Innovation Economics	9 CR
M-WIWI-101478	Innovation and Growth	9 CR
M-WIWI-101500	Microeconomic Theory	9 CR
M-WIWI-101406	Network Economics	9 CR
M-WIWI-101502	Economic Theory and its Application in Finance	9 CR
M-WIWI-101468	Environmental Economics	9 CR
M-WIWI-101511	Advanced Topics in Public Finance	9 CR
M-WIWI-101485	Transport Infrastructure Policy and Regional Development	9 CR
M-WIWI-101496	Growth and Agglomeration	9 CR

5.4 Informatics

Credits
9

Election block: Informatik (1 item)		
M-WIWI-101472	Informatics	9 CR

5.5 Operations Research

Credits
9

Election block: Operations Research (1 item)		
M-WIWI-101473	Mathematical Programming	9 CR
M-WIWI-102832	Operations Research in Supply Chain Management	9 CR
M-WIWI-102805	Service Operations	9 CR
M-WIWI-103289	Stochastic Optimization	9 CR

5.6 Engineering Sciences

Credits
18

Election block: Ingenieurwissenschaften (2 items)		
M-MACH-101298	Automated Manufacturing Systems	9 CR
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-MACH-101274	Rail System Technology	9 CR
M-MACH-101290	BioMEMS	9 CR
M-MACH-101263	Introduction to Logistics	9 CR
M-MACH-101296	Energy and Process Technology I	9 CR
M-MACH-101297	Energy and Process Technology II	9 CR
M-BGU-100998	Design, Construction, Operation and Maintenance of Highways	9 CR
M-ETIT-101164	Generation and transmission of renewable power	9 CR
M-MACH-101264	Handling Characteristics of Motor Vehicles	9 CR
M-MACH-101265	Vehicle Development	9 CR
M-MACH-101266	Automotive Engineering	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-MACH-101282	Global Production and Logistics	9 CR
M-BGU-101064	Fundamentals of Transportation	9 CR
M-CIWVT-101120	Principles of Food Process Engineering	9 CR
M-ETIT-101163	High-Voltage Technology	9 CR
M-MACH-102626	Major Field: Integrated Product Development	16 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-BGU-101884	Lean Management in Construction	9 CR
M-MACH-101280	Logistics in Value Chain Networks	9 CR
M-MACH-101277	Material Flow in Logistic Systems	9 CR
M-MACH-101278	Material Flow in Networked Logistic Systems	9 CR
M-MACH-101291	Microfabrication	9 CR
M-MACH-101292	Microoptics	9 CR
M-MACH-101287	Microsystem Technology	9 CR
M-MACH-101267	Mobile Machines	9 CR
M-MACH-101294	Nanotechnology	9 CR
M-WIWI-104837	Natural Hazards and Risk Management	9 CR
M-MACH-101295	Optoelectronics and Optical Communication	9 CR
M-BGU-101888	Project Management in Construction	9 CR
M-ETIT-101157	Control Engineering II	9 CR
M-ETIT-101158	Sensor Technology I	9 CR
M-ETIT-101159	Sensor Technology II	9 CR
M-BGU-101066	Safety, Computing and Law in Highway Engineering	9 CR
M-MACH-101268	Specific Topics in Materials Science	9 CR
M-BGU-100999	Highway Engineering	9 CR
M-MACH-101279	Technical Logistics	9 CR
M-BGU-104448	Urban Water Technologies	9 CR
M-MACH-101275	Combustion Engines I	9 CR
M-MACH-101303	Combustion Engines II	9 CR
M-BGU-101110	Process Engineering in Construction	9 CR
M-BGU-101065	Transportation Modelling and Traffic Management	9 CR
M-MACH-101284	Specialization in Production Engineering	9 CR
M-CIWVT-101119	Specialization in Food Process Engineering	9 CR
M-MACH-101283	Virtual Engineering A	9 CR

M-MACH-101281	Virtual Engineering B	9 CR
M-CIWVT-101121	Water Chemistry and Water Technology I	9 CR
M-CIWVT-101122	Water Chemistry and Water Technology II	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR

5.7 Compulsory Elective Modules

Credits
27

Election notes
Within the scope of the elective compulsory area, one **seminar module** (independent of subject) is to be taken over two seminars and further key qualification courses and two elective modules. Both elective modules can be chosen from Business Administration, Economics, Informatics, Operations Research, Engineering 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-101808	Seminar Module	9 CR
Election block: Betriebswirtschaftslehre (at most 18 credits)		
M-WIWI-101410	Business & Service Engineering	9 CR
M-WIWI-101498	Management Accounting	9 CR
M-WIWI-101510	Cross-Functional Management Accounting	9 CR
M-WIWI-101470	Data Science: Advanced CRM	9 CR
M-WIWI-103117	Data Science: Data-Driven Information Systems	9 CR
M-WIWI-103118	Data Science: Data-Driven User Modeling	9 CR
M-WIWI-101647	Data Science: Evidence-based Marketing	9 CR
M-WIWI-104080	Designing Interactive Information Systems	9 CR
M-WIWI-102808	Digital Service Systems in Industry	9 CR
M-WIWI-103261	Disruptive FinTech Innovations	9 CR
M-WIWI-103720	eEnergy: Markets, Services and Systems	9 CR
M-WIWI-101409	Electronic Markets	9 CR
M-WIWI-101451	Energy Economics and Energy Markets	9 CR
M-WIWI-101452	Energy Economics and Technology	9 CR
M-WIWI-101488	Entrepreneurship (EnTechnon)	9 CR
M-WIWI-101482	Finance 1	9 CR
M-WIWI-101483	Finance 2	9 CR
M-WIWI-101480	Finance 3	9 CR
M-WIWI-101508	Real Estate Economics and Sustainability	9 CR
M-WIWI-101471	Industrial Production II	9 CR
M-WIWI-101412	Industrial Production III	9 CR
M-WIWI-101411	Information Engineering	9 CR
M-WIWI-104068	Information Systems in Organizations	9 CR
M-WIWI-101507	Innovation Management	9 CR
M-WIWI-101449	Insurance Management II	9 CR
M-WIWI-103247	Intelligent Risk and Investment Advisory	9 CR
M-WIWI-101446	Market Engineering	9 CR
M-WIWI-101490	Marketing Management	9 CR
M-WIWI-101487	Sales Management	9 CR
M-WIWI-101506	Service Analytics	9 CR
M-WIWI-101503	Service Design Thinking	9 CR
M-WIWI-102806	Service Innovation, Design & Engineering	9 CR
M-WIWI-101448	Service Management	9 CR
M-WIWI-102754	Service Economics and Management	9 CR
M-WIWI-103119	Advanced Topics in Strategy and Management	9 CR
Election block: Volkswirtschaftslehre (at most 18 credits)		
M-WIWI-101497	Agglomeration and Innovation	9 CR
M-WIWI-101453	Applied Strategic Decisions	9 CR

M-WIWI-101504	Collective Decision Making	9 CR
M-WIWI-101505	Experimental Economics	9 CR
M-WIWI-101514	Innovation Economics	9 CR
M-WIWI-101478	Innovation and Growth	9 CR
M-WIWI-101500	Microeconomic Theory	9 CR
M-WIWI-101406	Network Economics	9 CR
M-WIWI-101502	Economic Theory and its Application in Finance	9 CR
M-WIWI-101468	Environmental Economics	9 CR
M-WIWI-101485	Transport Infrastructure Policy and Regional Development	9 CR
M-WIWI-101511	Advanced Topics in Public Finance	9 CR
M-WIWI-101496	Growth and Agglomeration	9 CR
Election block: Informatik (at most 18 credits)		
M-WIWI-101628	Emphasis in Informatics	9 CR
M-WIWI-101630	Electives in Informatics	9 CR
Election block: Operations Research (at most 18 credits)		
M-WIWI-101473	Mathematical Programming	9 CR
M-WIWI-102832	Operations Research in Supply Chain Management	9 CR
M-WIWI-102805	Service Operations	9 CR
M-WIWI-103289	Stochastic Optimization	9 CR
Election block: Ingenieurwissenschaften (at most 18 credits)		
M-WIWI-101404	Extracurricular Module in Engineering	9 CR
M-MACH-101298	Automated Manufacturing Systems	9 CR
M-MACH-101274	Rail System Technology	9 CR
M-MACH-101290	BioMEMS	9 CR
M-MACH-101263	Introduction to Logistics	9 CR
M-MACH-101296	Energy and Process Technology I	9 CR
M-MACH-101297	Energy and Process Technology II	9 CR
M-BGU-100998	Design, Construction, Operation and Maintenance of Highways	9 CR
M-ETIT-101164	Generation and transmission of renewable power	9 CR
M-MACH-101264	Handling Characteristics of Motor Vehicles	9 CR
M-MACH-101265	Vehicle Development	9 CR
M-MACH-101266	Automotive Engineering	9 CR
M-MACH-101276	Manufacturing Technology	9 CR
M-MACH-101282	Global Production and Logistics	9 CR
M-BGU-101064	Fundamentals of Transportation	9 CR
M-CIWVT-101120	Principles of Food Process Engineering	9 CR
M-ETIT-101163	High-Voltage Technology	9 CR
M-MACH-101272	Integrated Production Planning	9 CR
M-MACH-102626	Major Field: Integrated Product Development	16 CR
M-BGU-101884	Lean Management in Construction	9 CR
M-MACH-101280	Logistics in Value Chain Networks	9 CR
M-MACH-101277	Material Flow in Logistic Systems	9 CR
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M-CIWVT-101121	Water Chemistry and Water Technology I	9 CR
M-CIWVT-101122	Water Chemistry and Water Technology II	9 CR
M-MACH-101286	Machine Tools and Industrial Handling	9 CR
Election block: Statistik (at most 18 credits)		
M-WIWI-101637	Analytics and Statistics	9 CR
M-WIWI-101638	Econometrics and Statistics I	9 CR
M-WIWI-101639	Econometrics and Statistics II	9 CR
Election block: Recht oder Soziologie (at most 9 credits)		
M-INFO-101242	Governance, Risk & Compliance	9 CR
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-101169	Sociology	9 CR
M-INFO-101191	Commercial Law	9 CR

6 Modules

M 6.1 Module: Advanced Topics in Public Finance [M-WIWI-101511]

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

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

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

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

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

Competence Goal
The student

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

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

Content
As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs.

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

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

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

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

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

M 6.2 Module: Advanced Topics in Strategy and Management [M-WIWI-103119]

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

Credits	Language	Level	Version
9	Deutsch	4	1

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-106188	Workshop Current Topics in Strategy and Management	3 CR	Lindstädt
T-WIWI-106189	Workshop Business Wargaming – Analyzing Strategic Interactions	3 CR	Lindstädt
T-WIWI-106190	Strategy and Management Theory: Developments and "Classics"	3 CR	Lindstädt

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

Competence Goal
Students

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

Prerequisites
None

Content
The module is divided into three main topics:

The students

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

Recommendation
None

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

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

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

M 6.3 Module: Agglomeration and Innovation [M-WIWI-101497]

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

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	Mitusch
T-WIWI-109194	Dynamic Macroeconomics	4,5 CR	Brumm
T-WIWI-102840	Innovationtheory and -Policy	4,5 CR	Ott
T-WIWI-103107	Spatial Economics	4,5 CR	Ott

Competence Certificate
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must add up to at least 9.

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

Competence Goal
The student

- applies quantitative methods in the context of economic models
- learns advanced micro- and macroeconomic theories
- is able to derive policy recommendations based on theory
- can identify the importance of alternative incentive mechanisms for the development and spread of innovations
- begins to understand the connections between market form and the development of innovations
- analyzes the determinants of the spatial distribution of economic activity
- understands how processes of concentration result from the interplay of agglomeration and dispersion forces

Prerequisites
None

Content
The module comprises theories of incentives for the development of innovations as well as theories of wage-based labor mobility, which leads to spatial concentration processes. The microfounded optimality decisions of the actors are in each case transformed into macroeconomic results. In the context of the theory of innovations the diffusion of technological knowledge and the resulting effect on growth due to technological progress is discussed and economic-policy implications are derived. Spatial economics adds to the picture of economic activity by introducing a spatial point of view.

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

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

M 6.4 Module: Analytics and Statistics [M-WIWI-101637]

Responsible: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Economics and Management
Part of: Compulsory Elective Modules (Statistik)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-WIWI-103123	Advanced Statistics	4,5 CR	Grothe
Election block: Ergänzungsangebot (between 4,5 and 5 credits)			
T-WIWI-106341	Machine Learning 2 – Advanced Methods	5 CR	Zöllner
T-WIWI-103124	Multivariate Statistical Methods	4,5 CR	Grothe

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

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

Prerequisites
The course "*Advanced Statistics*" is compulsory.

Content

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

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

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

M 6.5 Module: Applied Strategic Decisions [M-WIWI-101453]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	3

Election block: Ergänzungsangebot (between 1 and 2 items as well as at least 4,5 credits)			
T-WIWI-102613	Auction Theory	4,5 CR	Ehrhart
T-WIWI-102614	Experimental Economics	4,5 CR	Weinhardt
T-WIWI-102622	Corporate Financial Policy	4,5 CR	Ruckes
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-102640	Market Engineering: Information in Institutions	4,5 CR	Weinhardt
T-WIWI-102862	Predictive Mechanism and Market Design	4,5 CR	Reiß
T-WIWI-105781	Incentives in Organizations	4,5 CR	Nieken
Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102861	Advanced Game Theory	4,5 CR	Ehrhart, Puppe, Reiß
T-WIWI-106623	Technical Conditions Met	0 CR	

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

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

Competence Goal
Students

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

Prerequisites
The course*Advanced Game Theory*is obligatory. Exception: The course*Introduction to Game Theory*[2520525] was completed.

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

Recommendation
Basic knowledge in game theory is assumed.

Annotation
The course *Predictive Mechanism and Market Design* is not offered each year.
The course "Decision Theory" [2520365] will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

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

M 6.6 Module: Automated Manufacturing Systems [M-MACH-101298]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-MACH-102162	Automated Manufacturing Systems	9 CR	Fleischer

Competence Certificate
written exam (120 minutes)

Competence Goal
The students

- are able to analyze implemented automated manufacturing systems and describe their components.
- are capable to assess the implemented examples of implemented automated manufacturing systems and apply them to new problems.
- are able to name automation tasks in manufacturing plants and name the components which are necessary for the implementation of each automation task.
- are capable with respect to a given task to plan the configuration of an automated manufacturing system and to determine the necessary components to its realization.
- are able to design and select components for a given use case of the categories: "Handling Technology", "Industrial Robotics", "Sensory" and "Controls".
- are capable to compare different concepts for multi-machine systems and select a suitable concept for a given use case.

Prerequisites
none

Content
The lecture provides an overview of the structure and functioning of automated manufacturing systems. In the introduction chapter the basic elements for the realization of automated manufacturing systems are given. This includes:

- Drive and control technology
- Handling technology for handling work pieces and tools
- Industrial Robotics
- Quality assurance in automated manufacturing
- automatic machines, cells, centers and systems for manufacturing and assembly
- structures of multi-machine systems
- planning of automated manufacturing systems

In the second part of the lecture, the basics are illustrated using implemented manufacturing processes for the production of automotive components (chassis and drive technology).The analysis of automated manufacturing systems for manufacturing of defined components is also included. In the field of vehicle power train both, the automated manufacturing process for the production of the conventional internal-combustion engine and the automated manufacturing process for the production of the prospective electric power train (electric motor and battery) are considered. In the field of car body, the focus is on the analysis of the process chain for the automated manufacturing of conventional sheet metal body parts, as well as for automated manufacturing of body components made out of fiber-reinforced plastics. Within tutorials, the contents from the lecture are advanced and applied to specific problems and tasks.

Workload
regular attendance: 63 hours
self-study: 207 hours

Learning type
Lectures, exercise, excursion

M 6.7 Module: Automotive Engineering [M-MACH-101266]

Responsible: Prof. Dr. Frank Gauterin
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Election block: Fahrzeugtechnik (at least 9 credits)			
T-MACH-100092	Automotive Engineering I	6 CR	Gauterin, Unrau
T-MACH-102117	Automotive Engineering II	3 CR	Gauterin, Unrau
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CR	Frey, Gauterin, Gießler
T-MACH-102116	Fundamentals for Design of Motor-Vehicle Bodies I	1,5 CR	Bardehle
T-MACH-102119	Fundamentals for Design of Motor-Vehicle Bodies II	1,5 CR	Bardehle
T-MACH-102093	Fluid Power Systems	5 CR	Geimer, Pult
T-MACH-102150	BUS-Controls	3 CR	Becker, Geimer
T-MACH-108889	BUS-Controls - Advance	0 CR	Daiß, Geimer

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
The student

- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

Prerequisites
None

Content
In the module Automotive Engineering the basics are taught, which are important for the development, the design, the production and the operation of vehicles. Particularly the primary important aggregates like engine, gear, drive train, chasis and auxiliary equipment are explained, but also all technical equipment, which make the operation safer and easier. Additionally the interior equipment is examined, which shall provide a preferably comfortable, optimum ambience to the user.

In the module Automotive Engineering the focus is on passenger cars and commercial vehicles, which are designed for road applications.

Recommendation
Knowledge of the content of the courses *Engineering Mechanics I* [2161238] and *Engineering Mechanics II* [1262276] is helpful.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

Learning type
The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

M 6.8 Module: BioMEMS [M-MACH-101290]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-MACH-100966	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I	3 CR	Guber
Election block: BioMEMS (at least 6 credits)			
T-MACH-102164	Practical Training in Basics of Microsystem Technology	3 CR	Last
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-101910	Microactuators	3 CR	Kohl
T-MACH-102172	Bionics for Engineers and Natural Scientists	3 CR	Hölscher
T-MACH-102176	Current Topics on BioMEMS	4 CR	Guber

Competence Certificate
The assessment is carried out as partial exams

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

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

Competence Goal
The student

- has basic as well as extensive knowledge about different fields of applications of BioMEMS
- understands continuative aspects of the related subjects optics and microoptics, micro actuators, replications techniques and bionics

Prerequisites
none

Content
Operations through small orifices, a pill which will take pictures on its way through your body or lab results right at the point of care - the need for easier and faster ways to help people is an important factor in research. The module BioMEMS (Bio(medical)-Micro-Electro-Mechanical-Systems) describes the application of microtechnology in the field of Life-Science, medical applications and Biotechnology and will teach you the necessary skills to understand and develop biological and medical devices.

The BioMEMS lectures will cover the fields of minimal invasive surgery, lab-on-chip systems, NOTES-Technology (Natural Orifice Transluminal Endoscopic Surgery), as well as endoscopic surgery and stent technology.

Additionally to the BioMEMS lectures you can specialize in various related fields like fabrication, actuation, optics and bionics. The course Replication processes will teach you some cost efficient and fast ways to produce parts for medical or biological devices. In the course Microactuation it is discussed how to receive movements in micrometer scale in a microsystem, this could be e.g. to drive micro pumps or micro valves. The necessary tools for optical measurement and methods of analysis to gain high resolution pictures are also part of this module. To deepen your knowledge and to get a hands-on experience this module contains a one week lab course. In the lecture bionics you can see how biological effects can be transferred into technical products.

Workload
270 hours

M 6.9 Module: Business & Service Engineering [M-WIWI-101410]

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

Credits	Level	Version
9	4	3

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

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

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

Competence Goal
The student should

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

Prerequisites
None

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

Recommendation
None

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

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

M 6.10 Module: Collective Decision Making [M-WIWI-101504]

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

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

Election block: Wahlpflichtangebot ()			
T-WIWI-102740	Public Management	4,5 CR	Wigger
T-WIWI-102859	Social Choice Theory	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 the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
Students

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

Prerequisites
None

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

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

M 6.11 Module: Combustion Engines I [M-MACH-101275]

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

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
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 6.12 Module: Combustion Engines II [M-MACH-101303]

Responsible: Dr.-Ing. Heiko Kubach
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
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 6.13 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	4	2

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

M 6.14 Module: Control Engineering II [M-ETIT-101157]

Responsible: Prof. Dr.-Ing. Sören Hohmann
Dr.-Ing. Mathias Kluwe

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Level	Version
9	4	2

Mandatory			
T-ETIT-100981	Automation of Discrete Event and Hybrid Systems	3 CR	Hohmann
T-ETIT-100666	Control of Linear Multivariable Systems	6 CR	Hohmann

Competence Certificate
The assessment is carried out as partial written exams of the single courses of this module (T-ETIT-100981 and T-ETIT-100666).

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

- have deeper knowledge in the field of control theory and system dynamics,
- are able to analyze multivariable systems in state space and frequency domain and are familiar with adequate methods for the control design,
- know the basics of modelling, simulation, analyses and control of discrete-event and hybrid systems.

Prerequisites
none

Content
This module broadens the basic knowledge of system dynamics of the students to the multivariable case. Both I/O-models in frequency domain and mainly state space models are regarded, for which several methods for the analysis and the control design with different goals (decoupling, robustness) and constraints (disturbances, sensor failures) are presented. Above that, the basics of modelling, simulation, analysis and control of discrete-event and hybrid systems are discussed.

Recommendation
For this module a basic knowledge in system theory and control engineering is assumed. These subjects can be found in the course *System Dynamics and Control Engineering* (2303155) which is recommended to have been attended beforehand.

Workload
See German version.

M 6.15 Module: Cross-Functional Management Accounting [M-WIWI-101510]

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

Credits	Language	Level	Version
9	Deutsch/Englisch	4	7

Mandatory			
T-WIWI-102885	Advanced Management Accounting	4,5 CR	Wouters
Election block: Ergänzungsangebot (4,5 credits)			
T-WIWI-105777	Business Intelligence Systems	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-105781	Incentives in Organizations	4,5 CR	Nieken
T-WIWI-102835	Marketing Strategy Business Game	1,5 CR	Klarmann
T-WIWI-107720	Market Research	4,5 CR	Klarmann
T-WIWI-102803	Modeling Strategic Decision Making	4,5 CR	Lindstädt
T-WIWI-102883	Pricing	4,5 CR	Feurer
T-WIWI-109864	Product and Innovation Management	3 CR	Klarmann
T-WIWI-102621	Valuation	4,5 CR	Ruckes
T-WIWI-108651	Extraordinary additional course in the module Cross-Functional Management Accounting	4,5 CR	Wouters

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

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

Prerequisites
The course "Advanced Management Accounting" is compulsory.

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

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

Recommendation
None

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

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

M 6.16 Module: Data Science: Advanced CRM [M-WIWI-101470]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	4

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-109921	Advanced Machine Learning	4,5 CR	Geyer-Schulz, Nazemi
T-WIWI-102762	Business Dynamics	4,5 CR	Geyer-Schulz
T-WIWI-103549	Intelligent CRM Architectures	4,5 CR	Geyer-Schulz
T-WIWI-102848	Personalization and Services	4,5 CR	Sonnenbichler
T-WIWI-102847	Recommender Systems	4,5 CR	Geyer-Schulz
T-WIWI-105778	Service Analytics A	4,5 CR	Fromm, Setzer

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
The student

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

Prerequisites
None

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

Recommendation
None

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

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

M 6.17 Module: Data Science: Data-Driven Information Systems [M-WIWI-103117]

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Level	Version
9	4	5

Election block: Wahlpflichtangebot ()			
T-WIWI-109863	Business Data Analytics: Application and Tools	4,5 CR	Weinhardt
T-WIWI-106187	Business Data Strategy	4,5 CR	Weinhardt
T-WIWI-105777	Business Intelligence Systems	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-106207	Practical Seminar: Data-Driven Information Systems	4,5 CR	Mädche, Setzer, Weinhardt
T-WIWI-105778	Service Analytics A	4,5 CR	Fromm, Setzer

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

Competence Goal
The student

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

Prerequisites
None.

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

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

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

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

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

Texteintrag

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

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

M 6.18 Module: Data Science: Data-Driven User Modeling [M-WIWI-103118]

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

Credits	Level	Version
9	4	4

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102614	Experimental Economics	4,5 CR	Weinhardt
T-WIWI-102899	Modeling and Analyzing Consumer Behavior with R	4,5 CR	Dorner, Weinhardt
T-WIWI-108765	Practical Seminar: Advanced Analytics	4,5 CR	Weinhardt
T-WIWI-109863	Business Data Analytics: Application and Tools	4,5 CR	Weinhardt

Competence Certificate
The assessment is carried out as partial exams of the core course and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

Competence Goal
Students of this module

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

Prerequisites
None

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

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

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

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

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

M 6.19 Module: Data Science: Evidence-based Marketing [M-WIWI-101647]

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

Credits	Recurrence	Language	Level	Version
9	Once	Deutsch	4	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-103139	Marketing Analytics	4,5 CR	Klarmann
T-WIWI-107720	Market Research	4,5 CR	Klarmann

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

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

Competence Goal
Students

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

Prerequisites
Keine.

Content
This module provides in-depth knowledge of relevant quantitative and qualitative methods used in market research. Students can attend the following courses:

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

Recommendation
None

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

M 6.20 Module: Design, Construction, Operation and Maintenance of Highways [M-BGU-100998]

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

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

Mandatory			
T-BGU-106613	Design Basics in Highway Engineering	3 CR	Roos
T-BGU-106300	Infrastructure Management	6 CR	Roos

Competence Goal
See German version.

Prerequisites
The selection of this module excludes the selection of the module "Highway Engineering" (WI4INGBGU2).

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-BGU-100999 - Highway Engineering must not have been started.

Recommendation
None

Annotation
None

Workload
See German version.

M 6.21 Module: Designing Interactive Information Systems [M-WIWI-104080]

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

Credits	Language	Level	Version
9	Deutsch/Englisch	4	1

Mandatory			
T-WIWI-108461	Interactive Information Systems	4,5 CR	Mädche, Morana
Election block: Ergänzungsangebot (at most 4,5 credits)			
T-WIWI-105773	Digital Service Design	4,5 CR	Mädche
T-WIWI-108437	Practical Seminar: Information Systems and Service Design	4,5 CR	Mädche

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

Competence Goal
The student

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

Prerequisites
The course “Interactive Information Systems” is compulsory and must be examined.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-103200 - Designing Interactive Systems must not have been started.

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

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

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

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

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

M 6.22 Module: Digital Service Systems in Industry [M-WIWI-102808]

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

Organisation: KIT Department of Economics and Management

Part of: Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102872	Challenges in Supply Chain Management	4,5 CR	Mohr
T-WIWI-102822	Industrial Services	4,5 CR	Fromm
T-WIWI-107043	Liberalised Power Markets	3 CR	Fichtner
T-WIWI-106200	Modeling and OR-Software: Advanced Topics	4,5 CR	Nickel
T-WIWI-106201	Digital Transformation of Organizations	4,5 CR	Mädche
T-WIWI-106563	Practical Seminar Digital Service Systems	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 the basics of the management of digital services applied on an industrial context
- gain an industry-specific insight into the importance and most relevant characteristics of information systems as key components of the digitalization of business processes, products and services
- are able to transfer and apply the models and methods introduced on practical scenarios and simulations.
- understand the control and optimization methods in the sector of service management and are able to apply them properly.

Prerequisites
This module can only be assigned as an elective module.

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

Recommendation
None

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

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

M 6.23 Module: Disruptive FinTech Innovations [M-WIWI-103261]

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

Credits	Language	Level	Version
9	Englisch	4	1

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-106193	Engineering FinTech Solutions	4,5 CR	Ulrich
T-WIWI-106496	Computational FinTech with Python and C++	1,5 CR	Ulrich
T-WIWI-106495	Automated Financial Advisory	3 CR	Ulrich

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

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

Prerequisites
None.

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

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

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

Recommendation
None

Annotation
See respective lecture

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

M 6.24 Module: Econometrics and Statistics I [M-WIWI-101638]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: Compulsory Elective Modules (Statistik)

Credits	Recurrence	Language	Level	Version
9	Each term	Deutsch	4	3

Mandatory			
T-WIWI-103125	Applied Econometrics	4,5 CR	Schienle
Election block: Ergänzungsangebot (between 4,5 and 5 credits)			
T-WIWI-103066	Data Mining and Applications	4,5 CR	Nakhaeizadeh
T-WIWI-103064	Financial Econometrics	4,5 CR	Schienle
T-WIWI-103126	Non- and Semiparametrics	4,5 CR	Schienle
T-WIWI-103127	Panel Data	4,5 CR	Heller
T-WIWI-103065	Statistical Modeling of Generalized Regression Models	4,5 CR	Heller

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

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

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

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

M 6.25 Module: Econometrics and Statistics II [M-WIWI-101639]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: Compulsory Elective Modules (Statistik)

Credits	Recurrence	Language	Level	Version
9	Each term	Deutsch	4	2

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

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

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101638 - Econometrics and Statistics I must have been started.

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

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

M 6.26 Module: Economic Theory and its Application in Finance [M-WIWI-101502]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	4

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

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
The students

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

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

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

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

M 6.27 Module: eEnergy: Markets, Services and Systems [M-WIWI-103720]

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

Credits	Language	Level	Version
9	Deutsch	4	1

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-107501	Energy Market Engineering	4,5 CR	Weinhardt
T-WIWI-107503	Energy Networks and Regulation	4,5 CR	Weinhardt
T-WIWI-107504	Smart Grid Applications	4,5 CR	Weinhardt

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

Competence Goal
The student

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

Prerequisites
None.

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

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

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

M 6.28 Module: Electives in Informatics [M-WIWI-101630]

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: Compulsory Elective Modules (Informatik)

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

Election block: Wahlpflichtangebot ()			
T-WIWI-109445	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	5 CR	Sunyaev
T-WIWI-109248	Critical Information Infrastructures	5 CR	Sunyaev
T-WIWI-109246	Digital Health	4 CR	Sunyaev
T-WIWI-109270	Human Factors in Security and Privacy	5 CR	Volkamer
T-WIWI-102680	Computational Economics	5 CR	Shukla
T-WIWI-102661	Database Systems and XML	5 CR	Oberweis
T-WIWI-102668	Enterprise Architecture Management	5 CR	Wolf
T-WIWI-106423	Information Service Engineering	5 CR	Sack
T-WIWI-102666	Knowledge Discovery	5 CR	Sure-Vetter
T-WIWI-102667	Management of IT-Projects	5 CR	Schätzle
T-WIWI-106340	Machine Learning 1 - Basic Methods	5 CR	Zöllner
T-WIWI-106341	Machine Learning 2 – Advanced Methods	5 CR	Zöllner
T-WIWI-102697	Business Process Modelling	5 CR	Oberweis
T-WIWI-102679	Nature-Inspired Optimisation Methods	5 CR	Shukla
T-WIWI-109799	Process Mining	5 CR	Oberweis
T-WIWI-102874	Semantic Web Technologies	5 CR	Sure-Vetter
T-WIWI-105801	Service Oriented Computing	5 CR	Sure-Vetter
T-WIWI-102895	Software Quality Management	5 CR	Oberweis
T-WIWI-102676	Special Topics of Enterprise Information Systems	5 CR	Oberweis
T-WIWI-102669	Strategic Management of Information Technology	5 CR	Wolf
T-WIWI-103112	Web Science	5 CR	Sure-Vetter
Election block: Praktikum ()			
T-WIWI-109250	Emerging Trends in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-108439	Advanced Lab Security, Usability and Society	4 CR	Volkamer
T-WIWI-109786	Advanced Lab Security	4 CR	Volkamer
T-WIWI-109271	Advanced Lab User Studies in Security	4 CR	Volkamer
T-WIWI-109985	Project Lab Cognitive Automobiles and Robots	4 CR	Zöllner
T-WIWI-109983	Project Lab Machine Learning	4 CR	Zöllner
T-WIWI-109251	Selected Issues in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-109249	Sociotechnical Information Systems Development	4 CR	Sunyaev
T-WIWI-103523	Advanced Lab Informatics	4 CR	Oberweis, Sack, Sunyaev, Sure-Vetter, Volkamer, Zöllner

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

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

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Prerequisites
None.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

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

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

M 6.29 Module: Electronic Markets [M-WIWI-101409]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	4

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-108880	Blockchains & Cryptofinance	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102762	Business Dynamics	4,5 CR	Geyer-Schulz
T-WIWI-102886	Business Administration in Information Engineering and Management	5 CR	Geyer-Schulz
T-WIWI-102640	Market Engineering: Information in Institutions	4,5 CR	Weinhardt
T-WIWI-105946	Price Management	4,5 CR	Geyer-Schulz, Glenn
T-WIWI-102713	Telecommunication and Internet Economics	4,5 CR	Mitusch

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2) 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 coordination and motivation methods and analyzes them regarding their efficiency,
- classifies markets and describes the roles of the participants in a formal way,
- knows the conditions for market failure and knows and develops countermeasures,
- knows institutions and market mechanisms, their fundamental theories and empirical research results,
- knows the design criteria of market mechanisms and a systematical approach for creating new markets,
- models, analyzes and optimizes the structure and dynamics of complex business applications.

Prerequisites
None

Content
What are the conditions that make electronic markets develop and how can one analyse and optimize such markets?
In this module, the selection of the type of organization as an optimization of transaction costs is treated. Afterwards, the efficiency of electronic markets (price, information and allocation efficiency) as well as reasons for market failure are described. Finally, motivational issues llike bounded rationality and information assymetries (private information and moral hazard), as well as the development of incentive schemes, are presented. Regarding the market design, especially the interdependencies of market organization, market mechanisms, institutions and products are described and theoretical foundations are lectured.

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

Topics include:

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

Recommendation
None

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

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

M 6.30 Module: Emphasis in Informatics [M-WIWI-101628]

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: Compulsory Elective Modules (Informatik)

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

Election block: Wahlplfichtangebot (between 1 and 3 items)			
T-WIWI-109445	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	5 CR	Sunyaev
T-WIWI-109248	Critical Information Infrastructures	5 CR	Sunyaev
T-WIWI-109246	Digital Health	4 CR	Sunyaev
T-WIWI-109270	Human Factors in Security and Privacy	5 CR	Volkamer
T-WIWI-102680	Computational Economics	5 CR	Shukla
T-WIWI-102661	Database Systems and XML	5 CR	Oberweis
T-WIWI-102668	Enterprise Architecture Management	5 CR	Wolf
T-WIWI-106423	Information Service Engineering	5 CR	Sack
T-WIWI-102666	Knowledge Discovery	5 CR	Sure-Vetter
T-WIWI-102667	Management of IT-Projects	5 CR	Schätzle
T-WIWI-106340	Machine Learning 1 - Basic Methods	5 CR	Zöllner
T-WIWI-106341	Machine Learning 2 – Advanced Methods	5 CR	Zöllner
T-WIWI-102697	Business Process Modelling	5 CR	Oberweis
T-WIWI-102679	Nature-Inspired Optimisation Methods	5 CR	Shukla
T-WIWI-109799	Process Mining	5 CR	Oberweis
T-WIWI-102874	Semantic Web Technologies	5 CR	Sure-Vetter
T-WIWI-105801	Service Oriented Computing	5 CR	Sure-Vetter
T-WIWI-102895	Software Quality Management	5 CR	Oberweis
T-WIWI-102676	Special Topics of Enterprise Information Systems	5 CR	Oberweis
T-WIWI-102669	Strategic Management of Information Technology	5 CR	Wolf
T-WIWI-103112	Web Science	5 CR	Sure-Vetter
Election block: Praktikum ()			
T-WIWI-109250	Emerging Trends in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-108439	Advanced Lab Security, Usability and Society	4 CR	Volkamer
T-WIWI-109786	Advanced Lab Security	4 CR	Volkamer
T-WIWI-109271	Advanced Lab User Studies in Security	4 CR	Volkamer
T-WIWI-109985	Project Lab Cognitive Automobiles and Robots	4 CR	Zöllner
T-WIWI-109983	Project Lab Machine Learning	4 CR	Zöllner
T-WIWI-109251	Selected Issues in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-109249	Sociotechnical Information Systems Development	4 CR	Sunyaev
T-WIWI-103523	Advanced Lab Informatics	4 CR	Oberweis, Sack, Sunyaev, Sure-Vetter, Volkamer, Zöllner

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

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

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Prerequisites
None.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

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

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

M 6.31 Module: Energy and Process Technology I [M-MACH-101296]

Responsible: Heiner Wirbser
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-MACH-102211	Energy and Process Technology I	9 CR	Bauer, Schwitzke, Velji, Wirbser

Competence Certificate
The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module, whose sum of credits must meet the 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
In this modul students achieve a basic understanding of the technical properties of energy conversion processes and machines.

Prerequisites
None

Content
Energy and Process Technology 1:

1. thermodynamic basics and cycle processes (ITT)
2. basics of piston engines (IFKM)
3. basics of turbomachines (FSM)
4. basics of thermal turbomachines (ITS)

Annotation
All lectures and exams are hold in German only.

M 6.32 Module: Energy and Process Technology II [M-MACH-101297]

Responsible: Heiner Wirbser
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-MACH-102212	Energy and Process Technology II	9 CR	Schwitzke, Wirbser

Competence Certificate
The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module, whose sum of credits must meet the 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
In this modul students achieve the ability to evaluate solitary and interconnected energy systems with respect to societal and economical aspects

Prerequisites
None

Content
Energy and Process Technology 2:

1. basics in combustion and pollutant formation (ITT)
2. technical realisation and application of piston engines (IFKM) fluid flow engines (FSM) and thermal turbomachines (ITS)
3. technical aspects of energy supply systems and networks (ITS)

Annotation
All lectures and exams are hold in German only.

M 6.33 Module: Energy Economics and Energy Markets [M-WIWI-101451]

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

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

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

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

Competence Goal
The student

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

Prerequisites
The lecture Liberalised Power Markets has to be examined.

Content
Liberalised Power Markets: The European liberalisation process, energy markets, pricing, market failure, investment incentives, market power
Energy Trade and Risk Management: trade centres, trade products, market mechanisms, position and risk management
Simulation Game in Energy Economics: Simulation of the German electricity system

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

Annotation
From winter term 2017/2018 the course T-WIWI-102607Energy Policy will not be offered anymore in this module.

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

M 6.34 Module: Energy Economics and Technology [M-WIWI-101452]

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

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

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102793	Efficient Energy Systems and Electric Mobility	3,5 CR	Jochem
T-WIWI-102650	Energy and Environment	4,5 CR	Karl
T-WIWI-102830	Energy Systems Analysis	3 CR	Ardone
T-WIWI-107464	Smart Energy Infrastructure	3 CR	Ardone, Pustisek
T-WIWI-102695	Heat Economy	3 CR	Fichtner

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

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

Prerequisites
None

Content
Heat Economy: district heating, heating technologies, reduction of heat demand, statutory provisions
Energy Systems Analysis: Interdependencies in energy economics, energy systems modelling approaches in energy economics
Energy and Environment: emission factors, emission reduction measures, environmental impact
Efficient Energy Systems and Electric Mobility: concepts and current trends in energy efficiency, Overview of and economical, ecological and social impacts through electric mobility

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

M 6.35 Module: Entrepreneurship (EnTechnon) [M-WIWI-101488]

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

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	6

Election block: Pflichtbestandteil (1 item)			
T-WIWI-102864	Entrepreneurship	3 CR	Terzidis
Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102865	Business Planning	3 CR	Terzidis
T-WIWI-102866	Design Thinking	3 CR	Terzidis
T-WIWI-102833	Entrepreneurial Leadership & Innovation Management	3 CR	Linz, Terzidis
T-WIWI-102894	Entrepreneurship Research	3 CR	Terzidis
Election block: Ergänzungsangebot (1 item)			
T-WIWI-102612	Managing New Technologies	3 CR	Reiß
T-WIWI-102893	Innovation Management: Concepts, Strategies and Methods	3 CR	Weissenberger-Eibl
T-WIWI-102639	Business Models in the Internet: Planning and Implementation	4,5 CR	Weinhardt
T-WIWI-102851	Developing Business Models for the Semantic Web	3 CR	Studer
T-WIWI-102852	Case Studies Seminar: Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-102853	Roadmapping	3 CR	Koch
T-WIWI-102833	Entrepreneurial Leadership & Innovation Management	3 CR	Linz, Terzidis
T-WIWI-102865	Business Planning	3 CR	Terzidis
T-WIWI-102866	Design Thinking	3 CR	Terzidis
T-WIWI-102894	Entrepreneurship Research	3 CR	Terzidis
T-WIWI-109064	Joint Entrepreneurship Summer School	6 CR	Terzidis

Competence Certificate
See German version.

Competence Goal
See German version.

Prerequisites
None

Recommendation
None

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

M 6.36 Module: Environmental Economics [M-WIWI-101468]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

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

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

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

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

Prerequisites
None

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

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

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

M 6.37 Module: Experimental Economics [M-WIWI-101505]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	5

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

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

Competence Goal
Students

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

Prerequisites
None.

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

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

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

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

M 6.38 Module: Extracurricular Module in Engineering [M-WIWI-101404]

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

Credits	Recurrence	Level	Version
9	Once	4	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 6.39 Module: Finance 1 [M-WIWI-101482]

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

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-102621	Valuation	4,5 CR	Ruckes
T-WIWI-102647	Asset Pricing	4,5 CR	Ruckes, Uhrig-Homburg

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module 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 core skills in economics and methodology in the field of finance
- assesses corporate investment projects from a financial perspective
- is able to make appropriate investment decisions on financial markets

Prerequisites
None

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

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

M 6.40 Module: Finance 2 [M-WIWI-101483]

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

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102647	Asset Pricing	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-108880	Blockchains & Cryptofinance	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102625	Exchanges	1,5 CR	Franke
T-WIWI-102622	Corporate Financial Policy	4,5 CR	Ruckes
T-WIWI-109050	Corporate Risk Management	4,5 CR	Ruckes
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102644	Fixed Income Securities	4,5 CR	Uhrig-Homburg
T-WIWI-102900	Financial Analysis	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-102645	Credit Risk	4,5 CR	Uhrig-Homburg
T-WIWI-102621	Valuation	4,5 CR	Ruckes

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module 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 in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101482 - Finance 1 must have been started.

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

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

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

M 6.41 Module: Finance 3 [M-WIWI-101480]

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

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

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102647	Asset Pricing	4,5 CR	Ruckes, Uhrig-Homburg
T-WIWI-108880	Blockchains & Cryptofinance	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-102625	Exchanges	1,5 CR	Franke
T-WIWI-102622	Corporate Financial Policy	4,5 CR	Ruckes
T-WIWI-109050	Corporate Risk Management	4,5 CR	Ruckes
T-WIWI-102643	Derivatives	4,5 CR	Uhrig-Homburg
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-102644	Fixed Income Securities	4,5 CR	Uhrig-Homburg
T-WIWI-102900	Financial Analysis	4,5 CR	Luedecke
T-WIWI-102623	Financial Intermediation	4,5 CR	Ruckes
T-WIWI-102626	Business Strategies of Banks	3 CR	Müller
T-WIWI-102646	International Finance	3 CR	Uhrig-Homburg
T-WIWI-102645	Credit Risk	4,5 CR	Uhrig-Homburg
T-WIWI-102621	Valuation	4,5 CR	Ruckes

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module 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 in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101482 - Finance 1 must have been started.
2. The module M-WIWI-101483 - Finance 2 must have been started.

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

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

M 6.42 Module: Fundamentals of Transportation [M-BGU-101064]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each summer term	2 semester	Deutsch/Englisch	4	3

Election block: Pflichtleistung (between 1 and 2 items as well as between 3 and 6 credits)			
T-BGU-106609	Characteristics of Transportation Systems	3 CR	Vortisch
T-BGU-106610	Transportation Systems	3 CR	Vortisch
Election block: Wahlpflicht (between 1 and 2 items as well as between 3 and 6 credits)			
T-BGU-106611	Freight Transport	3 CR	Chlond
T-BGU-106301	Long-Distance and Air Traffic	3 CR	Chlond
T-BGU-101005	Tendering, Planning and Financing in Public Transport	3 CR	Vortisch
T-BGU-100014	Seminar in Transportation	3 CR	Chlond, Vortisch
T-WIWI-103174	Seminar Mobility Services (Master)	3 CR	Satzger, Stryja
T-BGU-103425	Mobility Services and new Forms of Mobility	3 CR	Kagerbauer
T-BGU-103426	Strategic Transport Planning	3 CR	Waßmuth
T-BGU-106608	Information Management for Public Mobility Services	3 CR	Vortisch

Competence Goal
See German version.

Prerequisites
None

Recommendation
None

M 6.43 Module: Generation and transmission of renewable power [M-ETIT-101164]

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

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Election block: Wahlpflichtblock (at least 9 credits)			
T-ETIT-100830	Power Network	6 CR	Leibfried
T-ETIT-101941	Power Transmission and Power Network Control	5 CR	Leibfried
T-ETIT-100724	Photovoltaic System Design	3 CR	Grab
T-ETIT-101915	High-Voltage Test Technique	4 CR	Badent

Competence Goal
The student

- has wide knowledge of electrical power engineering,
- is capable to analyse and develop electrical power engineering systems.

Prerequisites
None

Content
The module deals with wide knowledge about the electrical power engineering. This ranges from the electric power equipment networks in terms of function, structure and interpretation on the calculation of electrical power networks to special areas such as the FACTS elements or power transformers.

M 6.44 Module: Global Production and Logistics [M-MACH-101282]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-MACH-105158	Global Production and Logistics - Part 1: Global Production	4 CR	Lanza
T-MACH-105159	Global Production and Logistics - Part 2: Global Logistics	4 CR	Furmans
Election block: Globale Produktion und Logistik (Ergänzungsbereich) (1 item)			
T-MACH-102128	Information Systems and Supply Chain Management	3 CR	Kilger
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-105165	Automotive Logistics	4 CR	Furmans
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch
T-MACH-102107	Quality Management	4 CR	Lanza

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 analyze the main topics of global production and logistics.
- can explain the main topics about planning and operations of global supply chains and are able to use simple models for planning.
- are capable to name the main topics about planning of global production networks.

Prerequisites
None

Content
The module Global Production and Logistics provides comprehensive and well-founded basics for the main topics of global production and logistics. The lectures aim to show opportunities and market conditions for global enterprises. Part 1 focuses on economic backgrounds, opportunities and risks of global production. Part 2 focuses on the structure of international logistics, their modeling, design and analysis. The threats in international logistics are discussed in case studies.

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

Learning type
Lectures, seminars, workshops, excursions

M 6.45 Module: Governance, Risk & Compliance [M-INFO-101242]

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	4	4

Election block: Governance, Risk & Compliance (at least 1 item as well as at least 9 credits)			
T-INFO-101316	Law of Contracts	3 CR	Dreier
T-INFO-101288	Corporate Compliance	3 CR	Dreier
T-INFO-108405	Data Protection by Design	3 CR	Raabe
T-INFO-102047	Seminar: Governance, Risk & Compliance	3 CR	Dreier
T-INFO-109910	IT- Security Law	3 CR	Raabe

M 6.46 Module: Growth and Agglomeration [M-WIWI-101496]

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

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

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

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

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

Competence Goal
The student

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

Prerequisites
None

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

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

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

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

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

M 6.47 Module: Handling Characteristics of Motor Vehicles [M-MACH-101264]

Responsible: Prof. Dr. Frank Gauterin
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Once	1 semester	Deutsch/Englisch	4	3

Election block: Fahrzeugeigenschaften (at least 9 credits)			
T-MACH-105152	Handling Characteristics of Motor Vehicles I	3 CR	Unrau
T-MACH-105153	Handling Characteristics of Motor Vehicles II	3 CR	Unrau
T-MACH-105154	Vehicle Comfort and Acoustics I	3 CR	Gauterin
T-MACH-105155	Vehicle Comfort and Acoustics II	3 CR	Gauterin
T-MACH-105156	Vehicle Mechatronics I	3 CR	Ammon
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CR	Frey, Gauterin, Gießler

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 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 understands the characteristics of vehicles, owing to the construction and design tokens,
- knows and understands especially the factors being relevant for comfort and acoustics
- is capable of fundamentally evaluating and rating handling characteristics.

Prerequisites
None

Content
See courses.

Recommendation
Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 4.5 credit points is about 135 hours, and for courses with 3 credit points about 90 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

M 6.48 Module: High-Voltage Technology [M-ETIT-101163]

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

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Duration	Level	Version
9	2 semester	4	1

Mandatory			
T-ETIT-101913	High-Voltage Technology I	4,5 CR	Badent
T-ETIT-101914	High-Voltage Technology II	4,5 CR	Badent

Competence Goal
The student

- has wide knowledge of electrical power engineering,
- is capable to analyse and develop electrical power engineering systems.

Content
The module deals with wide knowledge about the electrical power engineering. This ranges from the electric power equipment networks in terms of function, structure and interpretation on the calculation of electrical power networks to special areas such as the FACTS elements or power transformers.

M 6.49 Module: Highway Engineering [M-BGU-100999]

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

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

Mandatory			
T-BGU-106300	Infrastructure Management	6 CR	Roos
T-BGU-101860	Special Topics in Highway Engineering and Environmental Impact Assessment	3 CR	Roos

Competence Goal
See German version.

Prerequisites
The selection of this module excludes the selection of the module "Design, Construction, Operation and Maintenance of Highways" (WI4INGBGU1).

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-BGU-100998 - Design, Construction, Operation and Maintenance of Highways must not have been started.

Recommendation
None

Annotation
None

Workload
See German version.

M 6.50 Module: Industrial Production II [M-WIWI-101471]

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

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

Mandatory			
T-WIWI-102631	Planning and Management of Industrial Plants	5,5 CR	Schultmann
Election block: Ergänzungsangebot aus dem Modul Industrielle Produktion III (at most 1 item)			
T-WIWI-102763	Supply Chain Management with Advanced Planning Systems	3,5 CR	Bosch, Göbelt
T-WIWI-102826	Risk Management in Industrial Supply Networks	3,5 CR	Wiens
T-WIWI-102828	Supply Chain Management in the Automotive Industry	3,5 CR	Heupel, Lang
T-WIWI-103134	Project Management	3,5 CR	Schultmann
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-102634	Emissions into the Environment	3,5 CR	Karl
T-WIWI-102882	International Management in Engineering and Production	3,5 CR	Sasse
T-WIWI-103133	Life Cycle Assessment	3,5 CR	Keller

Competence Certificate
The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Planning and Managing of Industrial Plants* [2581952] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal

- Students shall be able to describe the tasks of tactical production management with special attention drawn upon industrial plants.
- Students shall understand the relevant tasks in plant management (projection, realisation and supervising tools for industrial plants).
- Students shall be able to describe the special need of a techno-economic approach to solve problems in the field of tactical production management.
- Students shall be proficient in using selected techno-economic methods like investment and cost estimates, plant layout, capacity planning, evaluation principles of production techniques, production systems as well as methods to design and optimize production systems.
- Students shall be able to evaluate techno-economical approaches in planning tactical production management with respect to their efficiency, accuracy and relevance for industrial use.

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

Content

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

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

Workload
Total effort will account to 270 hours (9 credit points) and can be allocated according to the credit point rating. Therefore, a course with 3.5 credits requires an effort of approximately 105h and a course with 5.5 credits 165h.
The total effort for each course consists of attending lectures and tutorials, examination times and the time an average student needs to prepare himself in order to pass the exam with an average grade.

M 6.51 Module: Industrial Production III [M-WIWI-101412]

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

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

Mandatory			
T-WIWI-102632	Production and Logistics Management	5,5 CR	Schultmann
Election block: Ergänzungsangebot aus dem Modul Industrielle Produktion II (at most 1 item)			
T-WIWI-102634	Emissions into the Environment	3,5 CR	Karl
T-WIWI-102882	International Management in Engineering and Production	3,5 CR	Sasse
T-WIWI-103133	Life Cycle Assessment	3,5 CR	Keller
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-102763	Supply Chain Management with Advanced Planning Systems	3,5 CR	Bosch, Göbelt
T-WIWI-102826	Risk Management in Industrial Supply Networks	3,5 CR	Wiens
T-WIWI-102828	Supply Chain Management in the Automotive Industry	3,5 CR	Heupel, Lang
T-WIWI-103134	Project Management	3,5 CR	Schultmann

Competence Certificate
The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Production and Logistics Management* [2581954] and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

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

Competence Goal

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

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

Content

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

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

Workload
The total amount of work for this module is approx. 270 hours (9 credits). The allocation is made according to the credit points of the courses of the module.

The total number of hours per course results from the effort required to attend the lectures and exercises, as well as the examination times and the time required to achieve the learning objectives of the module for an average student for an average performance.

M 6.52 Module: Informatics [M-WIWI-101472]

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: Informatics

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	10

Election block: Wahlpflichtangebot ()			
T-WIWI-109445	Applied Informatics II - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services	5 CR	Sunyaev
T-WIWI-109248	Critical Information Infrastructures	5 CR	Sunyaev
T-WIWI-109246	Digital Health	4 CR	Sunyaev
T-WIWI-109270	Human Factors in Security and Privacy	5 CR	Volkamer
T-WIWI-102680	Computational Economics	5 CR	Shukla
T-WIWI-102661	Database Systems and XML	5 CR	Oberweis
T-WIWI-102668	Enterprise Architecture Management	5 CR	Wolf
T-WIWI-106423	Information Service Engineering	5 CR	Sack
T-WIWI-102666	Knowledge Discovery	5 CR	Sure-Vetter
T-WIWI-102667	Management of IT-Projects	5 CR	Schätzle
T-WIWI-106340	Machine Learning 1 - Basic Methods	5 CR	Zöllner
T-WIWI-106341	Machine Learning 2 – Advanced Methods	5 CR	Zöllner
T-WIWI-102697	Business Process Modelling	5 CR	Oberweis
T-WIWI-102679	Nature-Inspired Optimisation Methods	5 CR	Shukla
T-WIWI-109799	Process Mining	5 CR	Oberweis
T-WIWI-102874	Semantic Web Technologies	5 CR	Sure-Vetter
T-WIWI-105801	Service Oriented Computing	5 CR	Sure-Vetter
T-WIWI-102895	Software Quality Management	5 CR	Oberweis
T-WIWI-102676	Special Topics of Enterprise Information Systems	5 CR	Oberweis
T-WIWI-102669	Strategic Management of Information Technology	5 CR	Wolf
T-WIWI-103112	Web Science	5 CR	Sure-Vetter
Election block: Praktikum (between 0 and 1 items)			
T-WIWI-109250	Emerging Trends in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-108439	Advanced Lab Security, Usability and Society	4 CR	Volkamer
T-WIWI-109786	Advanced Lab Security	4 CR	Volkamer
T-WIWI-109271	Advanced Lab User Studies in Security	4 CR	Volkamer
T-WIWI-109985	Project Lab Cognitive Automobiles and Robots	4 CR	Zöllner
T-WIWI-109983	Project Lab Machine Learning	4 CR	Zöllner
T-WIWI-109251	Selected Issues in Critical Information Infrastructures	4 CR	Sunyaev
T-WIWI-109249	Sociotechnical Information Systems Development	4 CR	Sunyaev
T-WIWI-103523	Advanced Lab Informatics	4 CR	Oberweis, Sack, Sunyaev, Sure-Vetter, Volkamer, Zöllner

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

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.

Please note the following information about the module component exams of Prof. Dr. H. Schmeck:

The examinations in Algorithms for Internet Applications [T-WIWI-102658], Efficient Algorithms [T-WIWI-102655], Organic Computing [T-WIWI-102659] and Smart Energy Distribution [T-WIWI-102845] are offered latest until summer term 2017 (repeaters only).

Competence Goal
The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Prerequisites
It is only allowed to choose one lab.

Content
The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

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

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

M 6.53 Module: Information Engineering [M-WIWI-101411]

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

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

Mandatory			
T-WIWI-109918	Foundations of Information Systems	5 CR	Mädche, Weinhardt
Election block: Ergänzungsangebot (between 4 and 4,5 credits)			
T-WIWI-107501	Energy Market Engineering	4,5 CR	Weinhardt
T-WIWI-102640	Market Engineering: Information in Institutions	4,5 CR	Weinhardt
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt

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

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

Competence Goal
The student

- understands and analyzes the central role of information as an economic good, a production factor, and a competitive factor,
- identifies, evaluates, prices, and markets information goods,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

Prerequisites
The course *Principles of Information Engineering and Management* [2540450] is compulsory and must be examined.

Content
In the lecture *Principles of Information Engineering and Management*, a clear distinction of information as a production, competitive, and economic good is introduced. The central role of information is explained through the concept of the "information lifecycle". The single phases from existence/generation through allocation and evaluation until the distribution and usage of information are analyzed from the business administration perspective and the microeconomic perspective.

In a second course the student can deepen his knowledge on the one hand on the design and operation of markets and on the other hand on the impact of digital goods in network industries regarding the pricing policies, business strategies and regulation issues. If choosen, the course Special Topics in Information Engineering & Management additionally provides an opportunity of practical research in the aforementioned range of subjects.

Recommendation
None

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

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

M 6.54 Module: Information Systems in Organizations [M-WIWI-104068]

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

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-105777	Business Intelligence Systems	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-106201	Digital Transformation of Organizations	4,5 CR	Mädche
T-WIWI-108461	Interactive Information Systems	4,5 CR	Mädche, Morana
T-WIWI-108437	Practical Seminar: Information Systems and Service Design	4,5 CR	Mädche

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

Competence Goal
The student

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

Prerequisites
None

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

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

Annotation
New module starting summer term 2018.

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

M 6.55 Module: Innovation and Growth [M-WIWI-101478]

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

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

Election block: Wahlpflichtangebot (between 9 and 10 credits)			
T-WIWI-109194	Dynamic Macroeconomics	4,5 CR	Brumm
T-WIWI-102785	Theory of Endogenous Growth	4,5 CR	Ott
T-WIWI-102840	Innovationtheory and -Policy	4,5 CR	Ott

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

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

Prerequisites
None

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

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

Workload
Total expenditure of time for 9 credits: 270 hours

Attendance time per lecture: 3x14h

Preparation and wrap-up time per lecture: 3x14h

Rest: Exam Preparation

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

M 6.56 Module: Innovation Economics [M-WIWI-101514]

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

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

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

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

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

Prerequisites
None

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

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

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

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

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

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

M 6.57 Module: Innovation Management [M-WIWI-101507]

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

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

Mandatory			
T-WIWI-102893	Innovation Management: Concepts, Strategies and Methods	3 CR	Weissenberger-Eibl
Election block: Wahlpflichtangebot (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-102852	Case Studies Seminar: Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-108774	Analyzing and Evaluating Innovation Processes	3 CR	Weissenberger-Eibl
T-WIWI-102853	Roadmapping	3 CR	Koch
T-WIWI-109932	A closer look at Social Innovation	3 CR	Beyer, Weissenberger-Eibl
T-WIWI-102858	Technology Assessment	3 CR	Koch
T-WIWI-102854	Technologies for Innovation Management	3 CR	Koch
Election block: Ergänzungsangebot (1 item)			
T-WIWI-102873	Current Issues in Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-102866	Design Thinking	3 CR	Terzidis
T-WIWI-108875	Digital Transformation and Business Models	3 CR	Koch
T-WIWI-102833	Entrepreneurial Leadership & Innovation Management	3 CR	Linz, Terzidis
T-WIWI-102864	Entrepreneurship	3 CR	Terzidis
T-WIWI-102852	Case Studies Seminar: Innovation Management	3 CR	Weissenberger-Eibl
T-WIWI-108774	Analyzing and Evaluating Innovation Processes	3 CR	Weissenberger-Eibl
T-WIWI-102853	Roadmapping	3 CR	Koch
T-WIWI-102854	Technologies for Innovation Management	3 CR	Koch
T-WIWI-102858	Technology Assessment	3 CR	Koch

Competence Certificate
See German version.

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

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

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

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

Recommendation
None

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

M 6.58 Module: Insurance Management II [M-WIWI-101449]

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

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

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102601	Insurance Marketing	4,5 CR	Schwake
T-WIWI-102648	Insurance Production	4,5 CR	Werner
T-WIWI-102637	Current Issues in the Insurance Industry	2 CR	Heilmann
T-WIWI-102636	Insurance Risk Management	2,5 CR	Maser
T-WIWI-102649	Risk Communication	4,5 CR	Werner
T-WIWI-102797	P&C Insurance Simulation Game	3 CR	Werner
T-WIWI-102603	Principles of Insurance Management	4,5 CR	Werner
T-WIWI-102841	Modelling, Measuring and Managing of Extreme Risks	2,5 CR	Werner

Competence Certificate
From 01.10.2017 (winter term 2017/2018) the module is no longer available.

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

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

Competence Goal
See German version.

Prerequisites
It is only possible to choose this module in combination with the module *Insurance Management I*. The module is passed only after the final partial exam of *Insurance Management I* has been passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101469 - Insurance Management I must have been started.

Content
See German version.

Recommendation
The courses chosen from the modules Insurance Management I or Insurance Management II are supposed to complement each other. Advice and information is available from the person responsible for the examination process at the Insurance Department of FBV.

Annotation
Please note:

- T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017.
- T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on;
- T-WIWI-102603 Principles of Insurance Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102636 Insurance Risk Management will be offered latest until summer term 2017 (beginners only);
- T-WIWI-102649 Risk Communication will be offered latest until winter term 2017/2018 (beginners only);
- T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).

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

M 6.59 Module: Integrated Production Planning [M-MACH-101272]

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

Part of: Engineering Sciences
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 6.60 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	4	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

Prerequisites
None

M 6.61 Module: Intelligent Risk and Investment Advisory [M-WIWI-103247]

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

Credits	Language	Level	Version
9	Englisch	4	3

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

Competence Certificate
In winter semester 2018/2019 no exam for the courses "Building Intelligent and Robo-Adviced Portfolios" and "Computational Risk and Asset Management I / II" will be offered.

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

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

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

Prerequisites
None.

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

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

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

Recommendation
None

Annotation
See respective lecture

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

M 6.62 Module: Introduction to Logistics [M-MACH-101263]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Pflichtblock (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 Logistik (Ergänzungsbereich) (1 item)			
T-MACH-102128	Information Systems and Supply Chain Management	3 CR	Kilger
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-MACH-105187	IT-Fundamentals of Logistics	3 CR	Thomas
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105171	Safety Engineering	4 CR	Kany
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

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

- acquires an overview of different logistic questions in practice,
- is able to model logistic systems with adequate accuracy by using simple models,
- is able to handle analytical methods for a performance evaluation of logistic systems,
- is able to identify cause and effects within logistic systems.

Prerequisites
none

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-MACH-101277 - Material Flow in Logistic Systems must not have been started.
2. The module M-MACH-101279 - Technical Logistics must not have been started.

Content
The module *Introduction to Logistics* provides well-founded knowledge in main questions of logistics. In this module, focuses on the acquisition of theoretical basics linked with exemplary practice questions are laid. To gain a deeper understanding, the course is accompanied by exercises and further improved by case studies.

Workload
270 hours

M 6.63 Module: Lean Management in Construction [M-BGU-101884]

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

Credits	Recurrence	Language	Level	Version
9	Each winter term	Deutsch	4	2

Mandatory			
T-BGU-108000	Lean Construction	4,5 CR	Haghsheno
T-BGU-101007	Project Paper Lean Construction	1,5 CR	Haghsheno
Election block: Wahlpflicht (between 1 and 2 items as well as between 3 and 4,5 credits)			
T-BGU-103430	Turnkey Construction I - Processes and Methods	1,5 CR	Haghsheno
T-BGU-103431	Turnkey Construction II - Trades and Technology	3 CR	Haghsheno
T-BGU-103427	Site Management	1,5 CR	Haghsheno
T-BGU-103429	Building Laws	3 CR	Haghsheno
T-BGU-103432	Project Management in Construction and Real Estate Industry I	3 CR	Haghsheno
T-BGU-103433	Project Management in Construction and Real Estate Industry II	3 CR	Haghsheno

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.

The exam must be repeated at the latest 2 semesters after the first try. The exam will be based on the content of the latest lecture.

The exam of of the course Lean Construction consists of a preparatory and oral assessment. The preparatory assessment is a group work and consists of an assignment with presentation. The preparatory assessment is precondition to attend the oral examination (30 min) of the course Lean Construction. The grade of the exam Lean Construction is defined by weighted average of grades for oral examination (75 %) and preparatory assignment (25 %).

Examination of courses Projektmanagement in der Bau- und Immobilienwirtschaft I, Projektmanagement in der Bau- und Immobilienwirtschaft II, and Baurecht are carried out written. Combinations of courses Schlüsselfertiges Bauen I, Schlüsselfertiges Bauen II, Bauleitung, and Nachtragsmanagementare examined orally.

Competence Goal
see German version

Module grade calculation
grade of the module is CP weighted average of grades of the partial exams

Prerequisites
The course Lean Construction is compulsory and must be examined.

Content
see German version

Recommendation
It is recommend to take the module Fundamentals of construction [WI3INGBGU3] from the Bachelor's degree program.

Annotation
none

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

Literature

Gehbauer, F. (2013) Lean Management Im Bauwesen. Skript des Instituts für Technologie und Management im Baubetrieb, Karlsruher Institut für Technologie (KIT).
Liker, J. & Meier, D. (2007) Praxisbuch, der Toyota Weg: für jedes Unternehmen. Finanzbuch Verlag.
Rother, M., Shook, J., & Wiegand, B. (2006). Sehen lernen: mit Wertstromdesign die Wertschöpfung erhöhen und Verschwendung beseitigen. Lean Management Institut.

M 6.64 Module: Logistics in Value Chain Networks [M-MACH-101280]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	3

Election block: Logistik in Wertschöpfungsnetzwerken (Kernbereich) (1 item as well as at least 6 credits)			
T-MACH-105181	Supply Chain Management	6 CR	Alicke
T-MACH-102089	Logistics - Organisation, Design and Control of Logistic Systems	6 CR	Furmans
Election block: Logistik in Wertschöpfungsnetzwerken (Ergänzungsbereich) (1 item as well as at least 3 credits)			
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105175	Airport Logistics	3 CR	Richter
T-MACH-105165	Automotive Logistics	4 CR	Furmans
T-MACH-102128	Information Systems and Supply Chain Management	3 CR	Kilger
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch

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

- is able to plan logistic systems and evaluate their performance,
- can use approaches of Supply Chain Management within the operational practice,
- identifies, analyses and evaluates risks within logistic systems.

Prerequisites
none

Modeled Conditions
You have to fulfill one of 2 conditions:

1. The module M-MACH-101282 - Global Production and Logistics must have been started.
2. The course T-MACH-102151 - Material Flow in Logistic Systems must have been started.

Content
The module *Logistics in value chain networks* provides basics for the main topics of logistics. Within the lecture basic methods for planning and running logistic systems are introduced. Furthermore special issues like supply chain management and risks in logistic systems are focused. To gain a deeper understanding, the course is accompanied by exercises.

Workload
270 hours

M 6.65 Module: Machine Tools and Industrial Handling [M-MACH-101286]

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

Part of: Engineering Sciences
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 6.66 Module: Major Field: Integrated Product Development [M-MACH-102626]

Responsible: Prof. Dr.-Ing. Albert Albers
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Language	Level	Version
16	Once	Deutsch	4	1

Mandatory			
T-MACH-105401	Integrated Product Development	16 CR	Albers, Albers Assistenten

Competence Certificate
oral examination (60 minutes)

Competence Goal
By working practically in experience-based learning arrangements with industrial development tasks, graduates are able to succeed in new and unknown situations when developing innovative products by using methodological and systematic approaches. They can apply and adapt strategies of development and innovation management, technical system analysis and team leadership to the situation. As a result, they are able to foster the development of innovative products in industrial development teams in prominent positions, taking into account social, economic and ethical aspects.

Prerequisites
None

Content
Organizational integration: integrated product development model, core team management and simultaneous engineering, informational integration: innovation management, cost management, quality management and knowledge management

Personal integration: team development and leadership

Guest lectures from the industry

Annotation
The participation in "Integrated Product Development" requires the concurrent participation in lectures (2145156), tutorials (2145157) and project work (2145300).

Due to organizational reasons, the number of participants is limited. Thus a selection has to be made. For registration to the selection process a standard form has to be used, that can be downloaded from IPEK hompage from april to july. The selection itself is made by Prof. Albers in personal interviews.

Workload
The work load is about 480 hours, corresponding to 16 credit points.

Learning type
lecture
tutorial
product development project

M 6.67 Module: Management Accounting [M-WIWI-101498]

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

Credits	Recurrence	Duration	Level	Version
9	Each term	2 semester	4	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
None

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

Annotation
The following courses are part of this module:

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

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

M 6.68 Module: Manufacturing Technology [M-MACH-101276]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Each winter term	1 semester	Deutsch	4	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 6.69 Module: Market Engineering [M-WIWI-101446]

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

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

Mandatory			
T-WIWI-102640	Market Engineering: Information in Institutions	4,5 CR	Weinhardt
Election block: Ergänzungsangebot (4,5 credits)			
T-WIWI-102613	Auction Theory	4,5 CR	Ehrhart
T-WIWI-108880	Blockchains & Cryptofinance	4,5 CR	Schuster, Uhrig-Homburg
T-WIWI-109941	eFinance: Information Systems for Securities Trading	4,5 CR	Weinhardt
T-WIWI-107501	Energy Market Engineering	4,5 CR	Weinhardt
T-WIWI-107503	Energy Networks and Regulation	4,5 CR	Weinhardt
T-WIWI-102614	Experimental Economics	4,5 CR	Weinhardt

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

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

Competence Goal
The students

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

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

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

Recommendation
None

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

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

M 6.70 Module: Marketing Management [M-WIWI-101490]

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

Credits	Recurrence	Duration	Level	Version
9	Each summer term	1 semester	4	11

Election block: Wahlpflichtangebot (at least 1 item)			
T-WIWI-107720	Market Research	4,5 CR	Klarmann
T-WIWI-102883	Pricing	4,5 CR	Feurer
T-WIWI-109864	Product and Innovation Management	3 CR	Klarmann
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-106137	Country Manager Simulation	1,5 CR	Feurer
T-WIWI-102835	Marketing Strategy Business Game	1,5 CR	Klarmann

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

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

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

Prerequisites
None

Content
The aim of this module is to deepen central marketing contents in different areas. Therefore the students can choose between the following marketing courses:

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

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

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

M 6.71 Module: Material Flow in Logistic Systems [M-MACH-101277]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-MACH-102151	Material Flow in Logistic Systems	6 CR	Furmans
Election block: Materialfluss in Logistiksystemen (Ergänzungsbereich) (1 item as well as at least 3 credits)			
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105175	Airport Logistics	3 CR	Richter
T-MACH-105165	Automotive Logistics	4 CR	Furmans
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch

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 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

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

Prerequisites
none

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

Workload
270 hours

Learning type
Lectures, tutorials.

M 6.72 Module: Material Flow in Networked Logistic Systems [M-MACH-101278]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Level	Version
9	Once	1 semester	4	2

Mandatory			
T-MACH-105189	Mathematical Models and Methods for Production Systems	6 CR	Furmans, Rimmele
Election block: Materialfluss in vernetzten Logistiksystemen (at least 3 credits)			
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105175	Airport Logistics	3 CR	Richter
T-MACH-105165	Automotive Logistics	4 CR	Furmans
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch

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

- acquires in-depth knowledge on the main topics of logistics, gets an overview of different logistic questions in practice,
- is able to evaluate logistic systems by using the learnt methods,
- is able to analyze and explain the phenomena of industrial material and value streams.

Prerequisites
The course "*Mathematical models and methods for Production Systems*" [T-MACH-102151] is compulsory and must be examined.

In combination with this module, the course "Material Flow in Logistics Systems" [T-MACH-102151] must be completed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102151 - Material Flow in Logistic Systems must have been started.

Content
The module *Material Flow in networked Logistic Systems* provides in-depth basics for the main topics of logistics and industrial material and value streams. The obligatory lecture focuses on queuing methods to model production systems. To gain a deeper understanding, the course is accompanied by exercises.

Recommendation
It is strongly recommended to successfully complete the course "Material Flow in Logistics Systems" [T-MACH-102151] before starting the module.

Workload
Regular attendance: 270 hours (9 credits). Lectures with 180 hours attendance 6 credits. Lectures with 120 hours 4 credits.

Learning type
Lecture, tutorial.

M 6.73 Module: Mathematical Programming [M-WIWI-101473]

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

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

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

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
The student

- names and describes basic notions for advanced optimization methods, in particular from continuous and mixed integer programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Prerequisites
At least one of the courses "Mixed Integer Programming I", "Parametric Optimization", "Convex Analysis", "Nonlinear Optimization I" and "Global Optimization I" has to be taken.

Students who choose the module in the field "compulsory elective modules" may select any two courses of the module.

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

Annotation
The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

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

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

M 6.74 Module: Microeconomic Theory [M-WIWI-101500]

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

Credits	Language	Level	Version
9	Deutsch	4	3

Election block: Wahlpflichtangebot (at least 9 credits)			
T-WIWI-102609	Advanced Topics in Economic Theory	4,5 CR	Mitusch
T-WIWI-102861	Advanced Game Theory	4,5 CR	Ehrhart, Puppe, Reiß
T-WIWI-102859	Social Choice Theory	4,5 CR	Puppe
T-WIWI-102613	Auction Theory	4,5 CR	Ehrhart
T-WIWI-105781	Incentives in Organizations	4,5 CR	Nieken

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

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

Competence Goal
Students

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

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

Prerequisites
None

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

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

M 6.75 Module: Microfabrication [M-MACH-101291]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-MACH-102166	Fabrication Processes in Microsystem Technology	3 CR	Bade
Election block: Mikrofertigung (Ergänzungsbereich) (at least 6 credits)			
T-MACH-102164	Practical Training in Basics of Microsystem Technology	3 CR	Last
T-MACH-100530	Physics for Engineers	6 CR	Dienwiebel, Gumbsch, Nesterov-Müller, Weygand
T-MACH-102167	Nanotribology and -Mechanics	3 CR	Dienwiebel, Hölscher
T-MACH-102191	Polymers in MEMS B: Physics, Microstructuring and Applications	3 CR	Worgull
T-MACH-102192	Polymers in MEMS A: Chemistry, Synthesis and Applications	3 CR	Rapp
T-MACH-102200	Polymers in MEMS C: Biopolymers and Bioplastics	3 CR	Rapp, Worgull
T-MACH-105556	Practical Course Polymers in MEMS	3 CR	Rapp, Worgull
T-MACH-109122	X-ray Optics	4 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
The student

- gains advanced knowledge concerning fabrication techniques in micrometer scale
- aquires knowledge in up-to-date developing research
- can detect and use causal relation in microfabrication process chains.

Prerequisites
none

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102166 - Fabrication Processes in Microsystem Technology must not have been started.

Content
This engineering module allows the student to gain advanced knowledge in the area of microfabrication. Different manufacturing methods are described and analyzed in an advanced manner. Necessary interdisciplinary knowledge from physics, chemistry, materials science and also up-to-date developments (nano and x-ray optics) in micro fabrication is offered.

Workload
270 hours

M 6.76 Module: Microoptics [M-MACH-101292]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Mikrooptik (at least 9 credits)			
T-MACH-102164	Practical Training in Basics of Microsystem Technology	3 CR	Last
T-MACH-102165	Selected Topics on Optics and Microoptics for Mechanical Engineers	3 CR	Mappes
T-MACH-101910	Microactuators	3 CR	Kohl
T-ETIT-100741	Laser Physics	4 CR	Koos
T-ETIT-101945	Optical Waveguides and Fibers	4 CR	Koos
T-MACH-109122	X-ray Optics	4 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
The student

- basic knowlegde for the applications of microoptical systems
- understanding fabrication processes of microoptical elements & systems
- analyzing strengths and weaknesses of lithography processes
- knowledge on the basics of optical sources and detectors and their use in technical systems
- fundamental knowledge on different lasers and their design
- knowlegde on X-ray imaging methodes

Prerequisites
none

Content
Optical imaging, measuring and sensor systems are a base for modern natural sciences. In particular life sciences and telecommunications have an intrinsic need for the application of optical technologies. Numerous fields of physics and engineering, e.g. astronomy and material sciences, require optical techniques. Micro optical systems are introduced in medical diagnostics and biological sensing as well as in products of the daily life.

In this module, an introduction to the basics of optics is provided; optical effects are presented with respect to their technical use.

Optical elements and instruments are presented. Fabrication processes of micro optical systems and elements, in particular lithography, are discussed.

In addition X-ray optics and X-ray imaging systems are presented as well as elements of optical telecommunication. A closer look on the physics behind lasers, being one of the most important technical light sources, is provided. As high end technology and clean room equipment is present in all the lectures of this module, the students will have a hands-on training with several experiments in micro optics.

Workload
270 hours

M 6.77 Module: Microsystem Technology [M-MACH-101287]

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

Part of: Engineering Sciences
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 6.78 Module: Mobile Machines [M-MACH-101267]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Level	Version
9	Once	1 semester	4	1

Election block: Mobile Arbeitsmaschinen (at least 9 credits)			
T-MACH-102093	Fluid Power Systems	5 CR	Geimer, Pult
T-MACH-105172	Simulation of Coupled Systems	4 CR	Geimer, Xiang
T-MACH-102150	BUS-Controls	3 CR	Becker, Geimer
T-MACH-105168	Mobile Machines	9 CR	Geimer
T-MACH-105160	Fundamentals in the Development of Commercial Vehicles I	1,5 CR	Zürn
T-MACH-105161	Fundamentals in the Development of Commercial Vehicles II	1,5 CR	Zürn

Competence Certificate
The assessment is carried out as a general oral exam (according to Section 4(2), 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 examination is offered every semester. Re-examinations are offered at every ordinary examination date.

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

The assessment may be carried out as partial oral exams (according to Section 4(2), 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.In this case 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.

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

Competence Goal
The student

- knows and understands the basic structure of the machines
- masters the basic skills to develop the selected machines

Prerequisites
None

Content
In the module of *Mobile Machines* [WI4INGMB15] the students will learn the structure of the machines and deepen the knowledge of the subject for developing the machines. After conclusion the module the student will know the latest developments in mobile machines and is able to evaluate the concepts and the trends of developments. The module is practically orientated and supported by industry partners.

Recommendation
Knowledge of Fluid Power Systems are helpful, otherwise it is recommended to take the course *Fluid Power Systems* [2114093].

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

M 6.79 Module: Module Master Thesis [M-WIWI-101650]

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

Credits	Language	Level	Version
30	Deutsch	4	1

Mandatory			
T-WIWI-103142	Master Thesis	30 CR	Studiendekan der KIT-Fakultät für Informatik, Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

Competence Certificate
The Master Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Industrial Engineering and Management. The Master Thesis is described in detail in § 11 of the examination regulation.
The review is carried out 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.

The regular processing time takes six months. On a reasoned request of the student, the examination board can extend the processing time of a maximum of three month. If the Master 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 Master 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 module grade is the grade for the Master Thesis.

Competence Goal
The student can independently handle a complex and unfamiliar subject based on scientific criteria and on the current state of research.

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

This is basically also done under consideration of social and/or ethical aspects.

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

He/she is in a position to sensibly structure a research paper, document them and clearly communicate the results in scientific form.

Prerequisites
Prerequisite for admission to the Master thesis is that 50 percent of the credit points has to be completed.
A written confirmation of the examinor about supervising the Master Thesis is required.

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

The Master 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 is marked as this." If this declaration is not given, the Master Thesis will not be accepted.

Modeled Conditions
The following conditions have to be fulfilled:

1. You need to earn at least 60 credits in the following fields:
    - Business Administration
    - Informatics
    - Engineering Sciences
    - Operations Research
    - Economics
    - Compulsory Elective Modules

Content
The Master Thesis is a major scientific work. The topic of the Master Thesis will be chosen by the student themselves and adjusted with the examinor. The topic has to be related to Industrial Engineering and Management and has to refer to subject-specific or interdisciplinary problems.

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

M 6.80 Module: Nanotechnology [M-MACH-101294]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Mandatory			
T-MACH-105180	Nanotechnology for Engineers and Natural Scientists	4 CR	Dienwiebel, Hölscher, Walheim
Election block: Nanotechnologie (Ergänzungsbereich) (at least 5 credits)			
T-MACH-102080	Nanotechnology with Clusterbeams	3 CR	Gspann
T-MACH-102167	Nanotribology and -Mechanics	3 CR	Dienwiebel, Hölscher
T-MACH-102164	Practical Training in Basics of Microsystem Technology	3 CR	Last
T-MACH-102152	Novel Actuators and Sensors	4 CR	Kohl, Sommer
T-MACH-102172	Bionics for Engineers and Natural Scientists	3 CR	Hölscher
T-ETIT-100740	Quantum Functional Devices and Semiconductor Technology	3 CR	Koos

Competence Certificate
The assessment is carried out as partial exams

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

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

Competence Goal
The student

- has detailed knowledge in the field of nanotechnology
- is able to evaluate the specific characteristics of nanosystems.

Prerequisites
none

Content
The module deals with the most important principles and fundamentals of modern nanotechnology. The compulsory module “Nanotechnology with scanning probe methods” introduces the basics of nanotechnology and nanoanalytics. The specific phenomena and properties found in nanoscale systems are the main topic of the module.

Workload
270 hours

M 6.81 Module: Natural Hazards and Risk Management [M-WIWI-104837]

Responsible: Prof. Dr. Michael Kunz
Organisation: KIT Department of Economics and Management
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Language	Level	Version
9	Each term	Deutsch	4	1

Election block: Wahlpflichtangebot (between 9 and 12 credits)			
T-BGU-101499	Introduction to Hydrogeology	5 CR	Goldscheider
T-BGU-108943	Engineering Hydrology	3 CR	Ehret
T-BGU-106597	Management of Water Resources and River Basins	6 CR	Ehret
T-BGU-101859	Morphodynamics	3 CR	Nestmann
T-BGU-106620	Examination Prerequisite Environmental Communication	0 CR	Kämpf
T-BGU-101676	Environmental Communication	4 CR	Kämpf

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
None

Content
See German version

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 6.82 Module: Network Economics [M-WIWI-101406]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

Credits	Level	Version
9	4	2

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

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

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

Competence Goal
The students

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

Prerequisites
None

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

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

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

M 6.83 Module: Operations Research in Supply Chain Management [M-WIWI-102832]

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

Credits	Language	Level	Version
9	Deutsch	4	5

Election block: Wahlpflichtangebot (at most 2 items)			
T-WIWI-102723	Graph Theory and Advanced Location Models	4,5 CR	Nickel
T-WIWI-106200	Modeling and OR-Software: Advanced Topics	4,5 CR	Nickel
T-WIWI-102715	Operations Research in Supply Chain Management	4,5 CR	Nickel
Election block: Ergänzungsangebot (at most 2 items)			
T-WIWI-106546	Introduction to Stochastic Optimization	4,5 CR	Rebennack
T-WIWI-102718	Discrete-Event Simulation in Production and Logistics	4,5 CR	Nickel
T-WIWI-102719	Mixed Integer Programming I	4,5 CR	Stein
T-WIWI-102720	Mixed Integer Programming II	4,5 CR	Stein
T-WIWI-106549	Large-scale Optimization	4,5 CR	Rebennack
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

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

Prerequisites
At least one of the courses "Operations Research in Supply Chain Management", "Graph Theory and Advanced Location Models", "Modeling and OR-Software: Advanced Topics" and "Special Topics of Stochastic Optimization (elective)" has to be taken.
Students who choose the module in the field "compulsory elective modules" may select any two courses of the module.

Exemption for the **summer term 2017**:

In the summer term 2017, the two OR master modules "Mathematical Optimization" and "Operations Research in Supply Chain Management" can be taken without compulsory courses. This corresponds to the already existing regulation when taking OR modules in the elective area. The derogation does not apply to the **winter term 2017/18**.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-WIWI-101415 - Operations Research in Supply Chain Management and Health Care Management must not have been started.

Content
Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.
This module considers several areas of SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of Supply Chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of supply chain management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Suppy Chain Mangement, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Recommendation
Basic knowledge as conveyed in the module*Introduction toOperations Research*[WI1OR] is assumed.

Annotation
Some lectures and courses are offered irregularly.
The planned lectures and courses for the next three years are announced online.

Workload
Total effort for 9 credits: ca. 270 hours

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

M 6.84 Module: Optoelectronics and Optical Communication [M-MACH-101295]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Optoelektronik und Optische Kommunikationstechnik (Kernbereich) (1 item)			
T-ETIT-100639	Optical Transmitters and Receivers	4 CR	Freude
Election block: Optoelektronik und Optische Kommunikationstechnik (Ergänzungsbereich) (at least 5 credits)			
T-MACH-102152	Novel Actuators and Sensors	4 CR	Kohl, Sommer
T-ETIT-101938	Communication Systems and Protocols	5 CR	Becker
T-ETIT-100741	Laser Physics	4 CR	Koos
T-ETIT-100740	Quantum Functional Devices and Semiconductor Technology	3 CR	Koos
T-ETIT-101945	Optical Waveguides and Fibers	4 CR	Koos

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
Student has basic knowledge of optical communication systems and related device and fabrication technologies.

- He/she can apply this knowledge to specific problems.

Prerequisites
none

Content
This module covers practical and theoretical aspects in the areas of optical communications and optoelectronics. System aspects of communication networks are complemented by fundamental principles and device technologies of optoelectronics as well as and microsystem fabrication technologies.

Workload
270 hours

M 6.85 Module: Principles of Food Process Engineering [M-CIWVT-101120]

Responsible: Dr. Volker Gaukel
Organisation: KIT Department of Chemical and Process Engineering
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-CIWVT-101874	Principles of Food Process Engineering	9 CR	Gaukel

Competence Goal
See German version.

Prerequisites
none

M 6.86 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	4	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 6.87 Module: Process Engineering in Construction [M-BGU-101110]

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

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

Mandatory			
T-BGU-101844	Process Engineering	3 CR	Schneider
Election block: Wahlpflicht (between 2 and 3 items as well as between 6 and 7,5 credits)			
T-BGU-101845	Construction Equipment	3 CR	Gentes
T-BGU-101832	Operation Methods for Foundation and Marine Construction	1,5 CR	Schneider
T-BGU-101801	Operation Methods for Earthmoving	1,5 CR	Schlick
T-BGU-101846	Tunnel Construction and Blasting Engineering	3 CR	Haghsheno
T-BGU-101847	Project Studies	3 CR	Gentes
T-BGU-101850	Disassembly Process Engineering	3 CR	Gentes

Competence Certificate
- 'Teilleistung' T-BGU-101844 with written examination according to § 4 Par. 2 No. 1

according to selected course:

- 'Teilleistung' T-BGU-101845 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-101832 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-101801 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-101846 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-101847 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-101850 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Competence Goal
Students understand different processes and the related construction equipment, it's technology, capabilities and constraints. Students can define process solutions consisting of machinery and devices. They can evaluate existing processes through knowledge about process performance and operating conditions, and the can identify potential for improvement.

Module grade calculation
grade of the module is CP weighted average of grades of the partial exams

Prerequisites
The course Verfahrenstechnik [6241704] is compulsory and must be examined.

Content
Within the frame of this module, various construction und conditioning processes will be presented as well as performance calculations conducted. Students learn about the construction machinery and devices of these processes. Transmission, generation, conversion and controlling of power are explained with the help of various practical examples. Moreover, the module includes possibilities for an on-site familiarization.

Recommendation
none

Annotation
None

Workload
see German version

M 6.88 Module: Project Management in Construction [M-BGU-101888]

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

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

Mandatory			
T-BGU-103432	Project Management in Construction and Real Estate Industry I	3 CR	Haghsheno
T-BGU-103431	Turnkey Construction II - Trades and Technology	3 CR	Haghsheno
Election block: Wahlpflicht (between 1 and 2 items as well as between 3 and 4,5 credits)			
T-BGU-103427	Site Management	1,5 CR	Haghsheno
T-BGU-103430	Turnkey Construction I - Processes and Methods	1,5 CR	Haghsheno
T-BGU-103428	Supplementary Claim Management	1,5 CR	Haghsheno
T-BGU-103429	Building Laws	3 CR	Haghsheno
T-BGU-103433	Project Management in Construction and Real Estate Industry II	3 CR	Haghsheno

Competence Certificate
- 'Teilleistung' T-BGU-103432 with written examination according to § 4 Par. 2 No. 1
- 'Teilleistung' T-BGU-103431 with oral examination according to § 4 Par. 2 No. 2

according to selected course:

- 'Teilleistung' T-BGU-103427 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-103430 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-103428 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-103429 with oral examination according to § 4 Par. 2 No. 2
- 'Teilleistung' T-BGU-103433 with oral examination according to § 4 Par. 2 No. 2

details about the learning controls see at the respective 'Teilleistung'

Competence Goal
see German version

Module grade calculation
grade of the module is CP weighted average of grades of the partial exams

Prerequisites
The courses Projektmanagement in der Bau- und Immobilienwirtschaft I and Schlüsselfertiges Bauen II are compulsory and must be examined.

Content
see German version

Recommendation
none

Annotation
none

Workload
see German version

Literature

DIETHELM, G.: Projektmanagement, Band 1: Grundlagen, Verlag Neue Wirtschafts-Briefe, Herne, 2000
DIETHELM, G.: Projektmanagement, Band 2: Sonderfragen, Verlag Neue Wirtschafts-Briefe, Herne, 2001
ESCHENBRUCH, K.: Recht der Projektsteuerung, Werner Verlag, München, 2003
HAHN, R.: Projektmanagement für Ingenieure, Wiley-VCH Verlag, Weinheim, 2002
KERZNER, H.: Project Management - A Systems Approach to Planning, Scheduling and Controlling, Wiley & Sons, 2006
KOCHENDÖRFER, B., LIEBCHEN, J.: Bau-Projekt-Management, Verlag B. G. Teubner, Stuttgart, 2001
Project Management Institute: A Guide to the Project Management Body of Knowledge: PMBOK Guide, 2008
ROSENAU, M:, W.: Succesful Project Management, Van Norstrand Reinhold, New York, 1992
VOLKMANN, W.: Projektabwicklung, Verlag für Wirtschaft und Verwaltung Hubert Wingen, Essen, 2002
ELWERT, Ulrich, Flassak, Alexander: Nachtragsmanagement in der Baupraxis - Grundlagen, Beispiele, Anwendung, Vieweg, 2., erw. und aktualisierte Aufl., Wiesbaden, 2008.
WÜRFELE, Falk [Hrsg.]: Nachtragsmanagement - Leistungsbeschreibung, Leistungsabweichung, Bauzeitverzögerung, Werner, Neuwied, 2006.
SCHERER, Holger: Integriertes Nachtragsmanagement - Verfahrenshandbuch für die Dokumentation von Behinderungen, Störungen und Nachtragssachverhalten auf der Grundlage der VOB, Zeittechnik-Verlag, Neu-Isenburg, 2001.
HELLER, Jörg: Sicherung der Nachtragsvergütung nach VOB und BGB, Zeittechnik-Verlag, Neu-Isenburg, 2000

M 6.89 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	4	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
see course description.

M 6.90 Module: Rail System Technology [M-MACH-101274]

Responsible: Prof. Dr.-Ing. Peter Gratzfeld
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	3

Mandatory			
T-MACH-102143	Rail System Technology	9 CR	Gratzfeld

Competence Certificate
Oral examination

Duration: 45 minutes

No tools or reference materials may be used during the exam.

Competence Goal

- The students understand relations and interdependencies between rail vehicles, infrastructure and operation in a rail system.
- Based on operating requirements and legal framework they derive the requirements concerning a capable infrastructure and suitable concepts of rail vehicles.
- They recognize the impact of alignment, understand the important function of the wheel-rail-contact and estimate the impact of driving dynamics on the operating program.
- They evaluate the impact of operating concepts on safety and capacity of a rail system.
- They know the infrastructure to provide power supply to rail vehicles with different drive systems.
- The students learn the role of rail vehicles and understand their classification. They understand the basic structure und know the functions of the main systems. They understand the overall tasks of vehicle system technology.
- They learn functions and requirements of car bodies and jugde advantages and disadvantages of design principles. They know the functions of the car body's interfaces.
- They know about the basics of running dynamics and bogies.
- The students learn about advantages and disadvantages of different types of traction drives and judge, which one fits best for each application.
- They understand brakes from a vehicular and an operational point of view. They assess the fitness of different brake systems.
- They know the basic setup of train control management system and understand the most important functions.
- They specify and define suitable vehicle concepts based on requirements for modern rail vehicles.

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

Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, power networks, filling stations
8. History (optional)
9. Vehicle system technology: structure and main systems of rail vehicles
10. Car body: functions, requirements, design principles, crash elements, interfaces
11. Bogies: forces, running gears, axle configuration
12. Drives: vehicle with/without contact wire, dual-mode vehicle
13. Brakes: tasks, basics, principles, blending, brake control
14. Train control management system: definitions, networks, bus systems, components, examples
15. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck coaches, locomotives, freight wagons

Annotation

A bibliography is available for download (Ilias-platform).

The lectures can be attended in the same term.

Workload

1. Regular attendance: 42 hours
2. Self-study: 42 hours
3. Exam and preparation: 186 hours

Learning type

Lectures

M 6.91 Module: Real Estate Economics and Sustainability [M-WIWI-101508]

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

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

Mandatory			
T-WIWI-102838	Real Estate Economics and Sustainability Part 1: Basics and Valuation	4,5 CR	Lorenz
T-WIWI-102839	Real Estate Economics and Sustainability Part 2: Reporting and Rating	4,5 CR	Lorenz

Competence Certificate
It is currently unclear whether the course "Real Estate Economics and Sustainability Part 2: Reporting and Rating" can be offered in summer term 2018. It must therefore be expected that the corresponding module M-WIWI-101508 "Real Estate Management and Sustainability" can not be completed according to schedule.
The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place.

Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

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

It is possible to include the grade of a seminar paper, dealing with a topic from the area of Real Estate Economics and Sustainability, into the final grade of the module (according to Section 4(2), 3 of the examination regulation). The seminar has a weight of 20 percent.

Competence Goal
The student

- possesses an overview of key interrelationships within the real estate industry concerning macro- and microeconomic questions as well as the interaction of the industry's key players;
- is aware of the basics concerning the sustainable development debate and knows about the possible contribution of buildings and the real estate industry to a more sustainable development;
- knows the basics, key methods and tools of property valuation and is able to apply them;
- is aware of the key influencing factors of a building's market value and is able to factor in sustainability considerations into market value estimates;
- possess an overview of important other methods and processes – besides property valuation – which are applied within the real estate industry to assess property related risks (e.g. property ratings) and to communicate property performance towards third parties (e.g. sustainability assessment of buildings and sustainability reporting of companies).

Prerequisites
None

Content
The implementation of sustainable development principles within the real estate industry requires taking into account sustainability considerations within real estate related procedures and decision making processes. Within this context, property valuation and valuation professionals play an important role.
Property valuations are carried out in almost any phase of the building life cycle and support, for example, financing as well as by and sell decisions.

Valuation methods and procedures, however, have to be adjusted to changing market participants' preferences and their willingness to pay. For this reason, the issue of "valuation and sustainability" is of particular topicality and relevance.

Within the real estate industry professionals are sought which combine micro- and macroeconomic knowledge and real estate specific expertise with knowledge and skills regarding the sustainability of buildings and building stocks.

The real estate industry offers attractive working and career opportunities. This teaching module / course therefore offers insights into key methods applied within the real estate industry (particularly valuation) and places them into the context of sustainable development. The focus of the module / course, however, is not only on theoretical content but also on the provisioning of linkages to real estate practice; this will be realized, amongst other issues, by practical tutorials which are offered in addition to the course lectures.

Recommendation
A combination with courses in the area of
• Finance

• Insurance

• Civil engineering and architecture

is recommended.

Particularly recommended is the successful completion of the following Bachelor-Modules:

- Real Estate Management I and II

- Design, Construction and Assessment of Green Buildings I and II

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

M 6.92 Module: Safety, Computing and Law in Highway Engineering [M-BGU-101066]

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

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

Mandatory			
T-BGU-101804	IT-Based Road Design	3 CR	Zimmermann
T-BGU-101674	Safety Management in Highway Engineering	3 CR	Zimmermann
T-BGU-106615	Laws concerning Traffic and Roads	3 CR	Hönig

Competence Goal
See German version.

Prerequisites
The examination "Design Basics in Highway Engineering" has to be passed. This can be taken either in the module "Design, Construction, Operation and Maintenance of Highways" (WI4INGBGU1) or can be approved from a previous study (e.g. Civil Engineering BSc at KIT).

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-101670 - Design Basics in Highway Engineering must have been passed.

Recommendation
None

Annotation
None

M 6.93 Module: Sales Management [M-WIWI-101487]

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

Credits	Duration	Level	Version
9	1 semester	4	6

Mandatory			
T-WIWI-102890	Sales Management and Retailing	3 CR	Klarmann
Election block: Ergänzungsangebot (at most 1 item)			
T-WIWI-106137	Country Manager Simulation	1,5 CR	Feurer
T-WIWI-102834	Case Studies in Sales and Pricing	1,5 CR	Klarmann
T-WIWI-106981	Digital Marketing and Sales in B2B	1,5 CR	Konhäuser
T-WIWI-102891	Price Negotiation and Sales Presentations	1,5 CR	Klarmann, Schröder
Election block: Ergänzungsangebot (at most 2 items)			
T-WIWI-107720	Market Research	4,5 CR	Klarmann
T-WIWI-102883	Pricing	4,5 CR	Feurer

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

Competence Goal
Students

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

Prerequisites
The course "Sales Management and Retailing" is compulsory.

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

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

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

M 6.94 Module: Seminar Module [M-WIWI-101808]

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

Credits	Language	Level	Version
9	Deutsch	4	6

Election block: Seminar Wirtschaftswissenschaften, Mathematik und Recht (between 3 and 6 credits)			
T-WIWI-103474	Seminar in Business Administration A (Master)	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103476	Seminar in Business Administration B (Master)	3 CR	Professorenschaft des Fachbereichs Betriebswirtschaftslehre
T-WIWI-103477	Seminar in Economics B (Master)	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-WIWI-103478	Seminar in Economics A (Master)	3 CR	Professorenschaft des Fachbereichs Volkswirtschaftslehre
T-WIWI-103479	Seminar in Informatics A (Master)	3 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-103480	Seminar in Informatics B (Master)	3 CR	Professorenschaft des Fachbereichs Informatik
T-WIWI-103481	Seminar in Operations Research A (Master)	3 CR	Nickel, Rebennack, Stein
T-WIWI-103482	Seminar in Operations Research B (Master)	3 CR	Nickel, Rebennack, Stein
T-WIWI-103483	Seminar in Statistics A (Master)	3 CR	Grothe, Schienle
T-WIWI-103484	Seminar in Statistics B (Master)	3 CR	Grothe, Schienle
T-INFO-101997	Seminar: Legal Studies I	3 CR	Dreier
T-INFO-105945	Seminar: Legal Studies II	3 CR	Dreier
Election block: Seminar Ingenieurwissenschaften (at most 1 item)			
T-MACH-102135	Conveying Technology and Logistics	3 CR	Furmans, Pagani
T-MACH-109062	Seminar Production Technology	3 CR	Fleischer, Lanza, Schulze
T-MACH-108737	Seminar Data-Mining in Production	3 CR	Lanza
T-BGU-100014	Seminar in Transportation	3 CR	Chlond, Vortisch
T-WIWI-108763	Seminar in Engineering Science Master (approval)	3 CR	Fachvertreter ingenieurwissenschaftlicher Fakultäten
Election block: SQ-Seminar (between 3 and 4 credits)			
T-WIWI-104680	Wildcard Key Competences Seminar 1	1 CR	
T-WIWI-104681	Wildcard Key Competences Seminar 2	2 CR	
T-WIWI-104682	Wildcard Key Competences Seminar 3	3 CR	
T-WIWI-104683	Wildcard Key Competences Seminar 4	1 CR	
T-WIWI-104684	Wildcard Key Competences Seminar 5	2 CR	
T-WIWI-104685	Wildcard Key Competences Seminar 6	3 CR	
T-WIWI-105956	Wildcard Key Competences Seminar 8	4 CR	

Competence Certificate
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). A detailed description of every singled assessment is given in the specific course characerization.

The final mark for the module is the average of the marks for each of the two seminars weighted by the credits and truncated after the first decimal. Grades of the KQ courses are not included.

Competence Goal

- The students are in a position to independently handle current, research-based tasks according to scientific criteria.
- They are able to research, analyze, abstract and critically review the information.
- They can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- They can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Prerequisites
The course specific preconditions must be observed.

- *Seminars*: Two seminars out of the course list, that have at least 3 CP each and are offered by a representative of the Department of Economics and Management or of the Center for applied legal studies (Department of Informatics), have to be chosen.
- Alternatively one of the two seminars can be absolved at a engineering department. The seminar has to be offered by a representative of the respective department as well. The assessment has to meet the demands of the Department of Economics and Management (active participation, term paper with a workload of at least 80 h, presentation). This alternative seminar **requires an official approval** and can be applied at the examination office of the Department of Economics and Management. Seminars at the institutes wbk and IFL do not require these approval.
- *Key Qualification (KQ)-course(s)*: One or more courses with at least 3 CP in total of additional key qualifications have to be chosen among the courses [HoC, ZAK, Sprachenzentrum].

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

M 6.95 Module: Sensor Technology I [M-ETIT-101158]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Level	Version
9	4	1

Mandatory			
T-ETIT-101911	Sensors	3 CR	Menesklou
Election block: Wahlpflicht (at most 2 items as well as at least 6 credits)			
T-ETIT-100706	Sensors and Actuators Laboratory	6 CR	Menesklou
T-ETIT-100709	Sensor Systems	3 CR	Menesklou
T-ETIT-100707	Seminar Sensors	3 CR	Menesklou
T-MACH-101910	Microactuators	3 CR	Kohl

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 assessment procedures are described for each course of the module separately.

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

Prerequisites
The course *Sensor Technology* [23231] is obligatory and has to be attended. The elected courses must not be credited in the module *Sensorik II* [WI4INGETIT5] or other modules.

Before *Experimental Laboratories in Sensors and Actuators* [23232] the course *Sensor Technology* [23231] has to be completed successfully.

Recommendation
Knowledge of electrical engineering is assumed. Therefore it is recommended to attend the courses *Electrical Engineering II* [23224] beforehand.

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

M 6.96 Module: Sensor Technology II [M-ETIT-101159]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Duration	Level	Version
9	1 semester	4	1

Election block: Wahlpflicht (at least 9 credits)			
T-ETIT-100706	Sensors and Actuators Laboratory	6 CR	Menesklou
T-ETIT-100709	Sensor Systems	3 CR	Menesklou
T-ETIT-100707	Seminar Sensors	3 CR	Menesklou
T-MACH-101910	Microactuators	3 CR	Kohl

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 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

- acquires fundamental principles in materials science and device technology of sensors.
- applies materials and sensors from the viewpoint of an application or development engineer.

Prerequisites
It is only possible to choose this module in combination with the module *Sensor Technology I* [WI4INGETIT3]. The module is passed only after the final partial exam of *Sensor Technology I* is additionally passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-ETIT-101158 - Sensor Technology I must have been started.

Content
The operating principles of the most important sensors are taught. The student will learn to use the acquired knowledge for key issues relating to select and use sensors. Sensor module I gives an overview of the basic sensor principles. Sensor module II goes into specific topics of sensors and actuators further.

Recommendation
Knowledge of electrical engineering is assumed. Therefore it is recommended to attend the courses *Electrical Engineering II* [23224] beforehand.

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

M 6.97 Module: Service Analytics [M-WIWI-101506]

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	5

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-108715	Artificial Intelligence in Service Systems	4,5 CR	Satzger
T-WIWI-105777	Business Intelligence Systems	4,5 CR	Mädche, Nadj, Toreini
T-WIWI-102822	Industrial Services	4,5 CR	Fromm
T-WIWI-102899	Modeling and Analyzing Consumer Behavior with R	4,5 CR	Dorner, Weinhardt
T-WIWI-105778	Service Analytics A	4,5 CR	Fromm, Setzer
T-WIWI-109940	Special Topics in Information Systems	4,5 CR	Weinhardt

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

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

Competence Goal
Students

- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context
- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

Prerequisites
None

Content
The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.

It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

Recommendation
The courses Service Analytics A [2595501] or Service Analytics B [2540498] should be applied.

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 6.98 Module: Service Design Thinking [M-WIWI-101503]

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

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

Mandatory			
T-WIWI-102849	Service Design Thinking	9 CR	Satzger, Weinhardt

Competence Certificate
The assessment is carried out as a general exam (according to Section 4(2), 3 of the examination regulation). The overall grade of the module is the grade of the examination (according to Section 4(2), 3 of the examination regulation).

Competence Goal

- Deep knowledge of the innovation method Design Thinking, as introduced and promoted by Stanford University
- Development of new, creative solutions through extensive observation of oneself and one's environment, in particular with regard to the relevant service users
- Know how to use prototyping and experimentation to visualize one's ideas, to test and iteratively develop them, and to converge on a solution
- Learn to apply the method to a real innovation projects issued by industry partners.

Prerequisites
None

Content

- Paper Bike: Learning about the basic method elements by building a paper bike that has to fulfill a given set of challenges. The bikes will be tested in a race during an international Kick-Off event with other universities of the SUGAR network (intern. Design Thinking network).
- Design Space Exploration: Exploring the problem space through customer and user observation as well as desk research.
- Critical Function Prototype: Identification of critical features from the customer's perspective that can contribute to the solution of the overarching problem. Building and testing prototypes that integrate these functionalities.
- Dark Horse Prototype: Inverting earlier assumptions and experiences, which leads to the inclusion of new features and solutions. Developing radically new ideas are in the focus of this phase.
- Funky Prototype: Integration of the individually tested and successful functions to several complete solution scenarios, which are further tested and developed.
- Functional Prototype: Selection of successful scenarios from the previous phase and building a higher resolution prototype. The final solution to the challenge is lade out in detail and tested with users.
- Final Prototype: Implementing the functional prototype and presenting it to the customer.

Recommendation
This course is held in English – proficiency in writing and communication is required.

Our past students recommend to take this course at the beginning of the masters program.

Annotation
Due to practical project work as a component of the program, access is limited.
The module (as well as the module component) spans two semesters. It starts in September every year and runs until end of June in the subsequent year. Entering the program is only possible at its beginning - after prior application in May/June.
For more information on the application process and the program itself are provided in the module component description and the program's website (http://sdt-karlsruhe.de).
Furthermore, the KSRI conducts an information event for applicants every year in May.
This module is part of the KSRI Teaching Program „Digital Service Systems“. For more information see the KSRI Teaching website: www.ksri.kit.edu/teaching.

Workload
The total amount of work for this module is approx. 270 hours (9 credits). The workload for this course is comparably high as the course runs in cooperation with partner universities from around the world as well as partner companies. This causes overhead.

M 6.99 Module: Service Economics and Management [M-WIWI-102754]

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

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-102881	Business and IT Service Management	4,5 CR	Satzger
T-WIWI-102640	Market Engineering: Information in Institutions	4,5 CR	Weinhardt
T-WIWI-106201	Digital Transformation of Organizations	4,5 CR	Mädche

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

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

Competence Goal
Students

- understand the scientific basics of the management of digital services and corresponding systems
- gain a comprehensive insight in the importance and the most important features of information systems as an central component of the digitalization of business processes, products and services
- know the most relevant concepts and theories to shape the digital transformation process of service systems successfully
- understand the OR methods in the sector of service management and apply them adequately
- are able to use large amounts of available data systematically for the planning, operation and improvement of complex service offers and to design and control information systems
- are able to develop market-oriented coordination mechanisms and apply service systems.

Prerequisites
None

Content
This module provides the foundation for the management of digital services and corresponding systems. The courses in this module cover the major concepts for a successful management of service systems and their digital transformation. Current examples from the research and practice enhance the relevance of the discussed topics.

Recommendation
None

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

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

M 6.100 Module: Service Innovation, Design & Engineering [M-WIWI-102806]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Gerhard Satzger

Organisation: KIT Department of Economics and Management

Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Wahlpflichtangebot (9 credits)			
T-WIWI-105773	Digital Service Design	4,5 CR	Mädche
T-WIWI-102639	Business Models in the Internet: Planning and Implementation	4,5 CR	Weinhardt
T-WIWI-108437	Practical Seminar: Information Systems and Service Design	4,5 CR	Mädche
T-WIWI-102799	Practical Seminar Service Innovation	4,5 CR	Satzger
T-WIWI-102641	Service Innovation	4,5 CR	Satzger

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

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

Competence Goal
Students

- know about the challenges, concepts, methods and tools of service innovation management and are able to use them successfully.
- have a profound comprehension of the development and design of innovative services and are able to apply suitable methods and tools on concrete and specific issues.
- are able to embed the concepts of innovation management, development and design of services into organisations
- are aware of the strategic importance of services, are able to present value creation in the context of services systems and to strategically exploit the possibilities of their digital transformation
- elaborate concrete and problem-solving solutions for practical tasks in teams.

Prerequisites
Dependencies between courses:
The course Practical Seminar Service Innovation cannot be applied in combination with the course Practical Seminar Digital Service Design.

Content
This module is designed to constitute the basis for the development of successful ICT supported innovations thus including the methods and tools for innovation management, for the design and the development of digital services and the implementation of new business models. Current examples from science and practice enhance the relevance of the topics addressed.

Recommendation
Attending the course Practical Seminar Service Innovation [2595477] is recommended in combination with the course Service Innovation [2595468].
Attending the course Practical Seminar Digital Service Design [new] is recommended in combination with the course Digital Service Design [new].

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

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

M 6.101 Module: Service Management [M-WIWI-101448]

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration
Compulsory Elective Modules (Betriebswirtschaftslehre)

Credits	Level	Version
9	4	4

Mandatory			
T-WIWI-102881	Business and IT Service Management	4,5 CR	Satzger
Election block: Ergänzungsangebot (4,5 credits)			
T-WIWI-108715	Artificial Intelligence in Service Systems	4,5 CR	Satzger
T-WIWI-106201	Digital Transformation of Organizations	4,5 CR	Mädche
T-WIWI-102822	Industrial Services	4,5 CR	Fromm
T-WIWI-102899	Modeling and Analyzing Consumer Behavior with R	4,5 CR	Dorner, Weinhardt
T-WIWI-105778	Service Analytics A	4,5 CR	Fromm, Setzer
T-WIWI-102641	Service Innovation	4,5 CR	Satzger

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

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

Competence Goal
The students

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- systematically use vast amounts of available data for planning, operation, personalization and improvement of complex service offerings, and
- understand and analyze innovation processes in corporations.

Prerequisites
The course *Business and IT Service Management* [2590484] is compulsory and must be examined.

Content
The module service management addresses the basics of developing and managing IT-based services. The lectures contained in this module teach the basics of developing and managing IT-based services and the application of OR methods in the field of service management. Moreover, students learn to systematically analyze vast amounts of data for planning, operation and improvement for complex service offerings. These tools enhance operational and strategic decision support and help to analyze and understand the overall innovation processes in corporations. Current examples from research and industry demonstrate the relevance of the topics discussed in this module.

Recommendation
None

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

M 6.102 Module: Service Operations [M-WIWI-102805]

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

Credits	Language	Level	Version
9	Deutsch	4	5

Election block: Wahlpflichtangebot (at most 2 items)			
T-WIWI-102718	Discrete-Event Simulation in Production and Logistics	4,5 CR	Nickel
T-WIWI-102884	Operations Research in Health Care Management	4,5 CR	Nickel
T-WIWI-102715	Operations Research in Supply Chain Management	4,5 CR	Nickel
T-WIWI-102716	Practical Seminar: Health Care Management (with Case Studies)	4,5 CR	Nickel
Election block: Ergänzungsangebot (at most 2 items)			
T-WIWI-102860	Supply Chain Management in the Process Industry	4,5 CR	Nickel
T-WIWI-102872	Challenges in Supply Chain Management	4,5 CR	Mohr

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

Competence Goal
Students

- knows the theoretical bases and the key components of Business Intelligence systems,
- acquires the basic skills to make use of business intelligence and analytics software in the service context
- are introduced into various application scenarios of analytics in the service context
- are able to distinguish different analytics methods and apply them in context
- learn how to apply analytics software in the service context
- are trained for the structured compilation and solution of practice relevant problems with the help of commercial business intelligence software packages as well as analytics methods and tools

Prerequisites
At least one of the four courses Operations Research in Supply Chain Management, Operations Research in Health Care Management, Practical seminar: Health Care Management or Discrete-Event Simulation in Production and Logistics has to be assigned.
Students who choose the module in the field "compulsory elective modules" may select any two courses of the module.

Content
The importance of services in modern economies is most evident – nearly 70% of gross value added are achieved in the tertiary sector and a growing number of industrial enterprises add customer specific services to their material goods or transform their business models fundamentally. The growing availability of data “Big Data” and their intelligent processing by applying analytic methods and business intelligence systems plays a key role.

It is the goal of the module to give students a comprehensive overview on the subject Business Intelligence & Analytics focusing on service issues. Various scenarios illustrate how the methods and systems introduced help to improve existing services or create innovative data-based services.

Recommendation
The course Practical Seminar Health Care should be combined with the course OR in Health Care Management.

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

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

M 6.103 Module: Sociology [M-GEISTSOZ-101169]

Responsible: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: Compulsory Elective Modules (Recht oder Soziologie)

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

Mandatory			
T-GEISTSOZ-104565	Computer Aided Data Analysis	0 CR	Nollmann
T-GEISTSOZ-109052	Application of Social Science Methods (WiWi)	9 CR	Nollmann

Competence Goal
The student

- Gains theoretical and methodical knowledge of social processes and structures,
- learns a script based data analysis tool (R, Stata, Python),
- gathers his/her data within an own framework and/or analyzes complex data,
- is able to present his/her work results in a precise and clear way.

Prerequisites
Students must pass three excersise sheets within the seminar "Computer based data analysis".

Content
The Sociology module offers students the opportunity to learn a data analysis tool (R, Stata, Python) within the framework of a two-semester course and to independently transfer this tool to a content-related question. Both the tool and the contents are determined by the lecturers. The contents can refer to the analysis of large population surveys (SOEP, Microcensus, ALLBUS), to own experiments, to own field studies or to Big Data analyses.

Annotation
Basic knowledge in multivariate regression and inference statistics is required.

M 6.104 Module: Specialization in Food Process Engineering [M-CIWVT-101119]

Responsible: Dr. Volker Gaukel
Organisation: KIT Department of Chemical and Process Engineering
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-CIWVT-101875	Specialization in Food Process Engineering	9 CR	Gaukel

Competence Goal
See German version.

Prerequisites
The module "Principles of Food Process Engineering" must be passed.

Content
See courses.

M 6.105 Module: Specialization in Production Engineering [M-MACH-101284]

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

Part of: Engineering Sciences
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 6.106 Module: Specific Topics in Materials Science [M-MACH-101268]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Election block: Spezielle Werkstoffkunde (at least 9 credits)			
T-MACH-102141	Constitution and Properties of Wearresistant Materials	4 CR	Ulrich
T-MACH-100287	Introduction to Ceramics	6 CR	Hoffmann
T-MACH-102099	Experimental Lab Class in Welding Technology, in Groups	4 CR	Dietrich
T-MACH-102111	Principles of Ceramic and Powder Metallurgy Processing	4 CR	Schell
T-MACH-102154	Laboratory Laser Materials Processing	4 CR	Schneider
T-MACH-102102	Physical Basics of Laser Technology	5 CR	Schneider
T-MACH-102137	Polymer Engineering I	4 CR	Elsner
T-MACH-102138	Polymer Engineering II	4 CR	Elsner
T-MACH-102103	Superhard Thin Film Materials	4 CR	Ulrich
T-MACH-100531	Systematic Materials Selection	4 CR	Dietrich
T-MACH-102139	Failure of Structural Materials: Fatigue and Creep	4 CR	Gruber, Gumbsch
T-MACH-102140	Failure of Structural Materials: Deformation and Fracture	4 CR	Gumbsch, Weygand
T-MACH-102157	High Performance Powder Metallurgy Materials	4 CR	Oberacker
T-MACH-102179	Structural Ceramics	4 CR	Hoffmann
T-MACH-102182	Ceramic Processing Technology	4 CR	Binder
T-MACH-102170	Structural and Phase Analysis	4 CR	Wagner
T-MACH-105150	Constitution and Properties of Protective Coatings	4 CR	Ulrich
T-MACH-105170	Welding Technology	4 CR	Farajian
T-MACH-105164	Laser in Automotive Engineering	4 CR	Schneider
T-MACH-105157	Foundry Technology	4 CR	Wilhelm
T-MACH-105178	Practical Course Technical Ceramics	1 CR	Oberacker

Competence Certificate
The assessment is carried out as partial exams 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
Students acquire special basic knowledge in selected areas of materials science and engineering and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Prerequisites
None

Content
See courses.

Workload
The module requires an average workload of 270 hours.

M 6.107 Module: Stochastic Optimization [M-WIWI-103289]

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

Credits	Recurrence	Duration	Level	Version
9	Each term	1 semester	4	6

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

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

The assessment procedures are described for each course of the module 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 advanced stochastic optimization methods, in particular, ways to algorithmically exploit the special model structures,
- knows the indispensable methods and models for quantitative analysis of stochastic optimization problems,
- models and classifies stochastic optimization problems and chooses the appropriate solution methods to solve also challenging stochastic optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions,
- identifies drawbacks of the solution methods and, if necessary, is able to makes suggestions to adapt them to practical problems.

Prerequisites
At least one of the courses "Advanced Stochastic Optimization" and "Large-scale Optimization" has to be taken.
Students who choose the module in the field "compulsory elective modules" may select any two courses of the module.

Content
The module focuses on the modeling as well as the imparting of theoretical principles and solution methods for optimization problems with special structure, which occur for example in the stochastic optimization.

Recommendation
It is recommended to listen to the lecture "Introduction to Stochastic Optimization" before the lecture "Advanced Stochastic Optimization" is visited.

Annotation
The course "Introduction to Stochastic Optimization" will be offered until the summer semester 2019 as an additional option in the elective offer of the module. Thereafter, the course can only be selected in the supplementary offer.

The courses are sometimes offered irregularly. The curriculum, planned for three years in advance, can be found on the Internet at http://sop.ior.kit.edu/28.php.

Workload
The total workload for this module is approximately 270 hours (9 credits). The allocation is made according to the credit points of the courses of the module. The total number of hours per course is determined by the amount of time spent attending the lectures and exercises, as well as the exam times and the time required to achieve the module's learning objectives for an average student for an average performance.

M 6.108 Module: Technical Logistics [M-MACH-101279]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Language	Level	Version
9	Deutsch	4	2

Election block: Technische Logistik (Kernbereich) (1 item as well as at least 6 credits)			
T-MACH-102163	Basics of Technical Logistics	6 CR	Mittwollen, Oellerich
Election block: Technische Logistik (Ergänzungsbereich) (1 item as well as at least 3 credits)			
T-MACH-105174	Warehousing and Distribution Systems	3 CR	Furmans
T-MACH-105171	Safety Engineering	4 CR	Kany
T-MACH-105151	Energy Efficient Intralogistic Systems	4 CR	Braun, Schönung
T-MACH-102159	Elements and Systems of Technical Logistics	4 CR	Fischer, Mittwollen
T-MACH-102160	Selected Applications of Technical Logistics	4 CR	Milushev, Mittwollen
T-MACH-105187	IT-Fundamentals of Logistics	3 CR	Thomas
T-WIWI-103091	Production and Logistics Controlling	3 CR	Rausch
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.

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

Competence Goal
The student

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

Prerequisites
none

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102163 - Basics of Technical Logistics must not have been started.

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

Workload
270 hours

M 6.109 Module: Transport Infrastructure Policy and Regional Development [M-WIWI-101485]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: Economics
Compulsory Elective Modules (Volkswirtschaftslehre)

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

Election block: Wahlpflichtangebot (2 items)			
T-WIWI-103107	Spatial Economics	4,5 CR	Ott
T-WIWI-100007	Transport Economics	4,5 CR	Mitusch, Szimba

Competence Certificate
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
The students

- understand the economic issues related to transport and regional development with a main focus on economic policy issues generated by the relationship of transport and regional development with the public sector
- are able to compare different considerations of politics, regulation and the private sector and to analyse and assess the respective decision problems both qualitatively and by applying appropriate methods from economic theory
- are prepared for careers in the public sector, particularly for public companies, politics, regulatory agencies, related consultancies, mayor construction companies or infrastructure project corporations

Prerequisites
None

Content
The development infrastructure (e.g. transport, energy, telecommunications) has always been one of the most relevant factors for economic development and particularly influences the development of the regional economy. From the repertoire of state actions, investments into transport infrastructure are often regarded the most important measure to foster regional economic growth. Besides the direct effects of transport policy on passenger and freight transport, a variety of individual economic activities is significantly dependent on the available or potential transport options. Decisions on the planning, financing and realization of mayor infrastructure projects require a solid and far-reaching consideration of direct and indirect growth effects with the occurring costs.
Through its combination of lectures the module reflects the complex interdependencies between infrastructure policy, transport industry and regional policy and provides its participants with a comprehensive understanding of the functionalities of one of the most important sectors of the economy and its relevance for economic policy.

Annotation
The courses *Assessment of Public Policies and Projects I* (winter term) and *Assessment of Public Policies and Projects II* (summer term) will no longer be part of this module. Student who have already had exams in this courses can integrate these exams in this module.

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

M 6.110 Module: Transportation Modelling and Traffic Management [M-BGU-101065]

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

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	Deutsch/Englisch	4	3

Election block: Pflichtleistung (between 2 and 3 items as well as between 6 and 9 credits)			
T-BGU-101797	Methods and Models in Transportation Planning	3 CR	Vortisch
T-BGU-101798	Traffic Engineering	3 CR	Vortisch
T-BGU-101799	Traffic Management and Transport Telematics	3 CR	Vortisch
T-BGU-101800	Traffic Flow Simulation	3 CR	Vortisch
Election block: Wahlpflicht (at most 1 item as well as between 0 and 3 credits)			
T-BGU-100010	Transportation Data Analysis	3 CR	Kagerbauer
T-BGU-106611	Freight Transport	3 CR	Chlond
T-BGU-106301	Long-Distance and Air Traffic	3 CR	Chlond
T-BGU-101005	Tendering, Planning and Financing in Public Transport	3 CR	Vortisch
T-BGU-100014	Seminar in Transportation	3 CR	Chlond, Vortisch
T-WIWI-103174	Seminar Mobility Services (Master)	3 CR	Satzger, Stryja
T-BGU-103425	Mobility Services and new Forms of Mobility	3 CR	Kagerbauer
T-BGU-103426	Strategic Transport Planning	3 CR	Waßmuth
T-BGU-106608	Information Management for Public Mobility Services	3 CR	Vortisch

Competence Goal
See German version.

Prerequisites
None

Recommendation
None

M 6.111 Module: Urban Water Technologies [M-BGU-104448]

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

Credits	Recurrence	Language	Level	Version
9	Each summer term	Englisch	4	1

Mandatory			
T-BGU-106600	Urban Water Infrastructure and Management	6 CR	Fuchs
T-BGU-109051	Wastewater and Storm Water Treatment Facilities for Industrial Engineers	3 CR	Fuchs, Morck

Prerequisites
None

Recommendation
None

M 6.112 Module: Vehicle Development [M-MACH-101265]

Responsible: Prof. Dr. Frank Gauterin
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Once	1 semester	Deutsch/Englisch	4	2

Election block: Fahrzeugentwicklung (at least 9 credits)			
T-MACH-105156	Vehicle Mechatronics I	3 CR	Ammon
T-MACH-105160	Fundamentals in the Development of Commercial Vehicles I	1,5 CR	Zürn
T-MACH-105161	Fundamentals in the Development of Commercial Vehicles II	1,5 CR	Zürn
T-MACH-102207	Tires and Wheel Development for Passenger Cars	3 CR	Leister
T-MACH-105162	Fundamentals of Automobile Development I	1,5 CR	Frech
T-MACH-105163	Fundamentals of Automobile Development II	1,5 CR	Frech
T-MACH-102156	Project Workshop: Automotive Engineering	4,5 CR	Frey, Gauterin, Gießler
T-MACH-105172	Simulation of Coupled Systems	4 CR	Geimer, Xiang
T-MACH-108888	Simulation of Coupled Systems - Advance	0 CR	Geimer, Xiang

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
The student

- knows and understands the procedures in automobile development,
- knows and understands the technical specifications at the development procedures,
- is aware of notable boundaries like legislation.

Prerequisites
None

Content
By taking the module Vehicle Development the students get to know the methods and processes applied in the automobile industry. They learn the technical particularities which have to be considered during the vehicle development and it is shown how the numerous single components cooperate in a harmoniously balanced complete vehicle. There is also paid attention on special boundary conditions like legal requirements.

Recommendation
Knowledge of the content of the courses *Engineering Mechanics I* [2161238], *Engineering Mechanics II* [2162276] and *Basics of Automotive Engineering I* [2113805], *Basics of Automotive Engineering II* [2114835] is helpful.

Workload
The total work load for this module is about 270 Hours (9 Credits). The partition of the work load is carried out according to the credit points of the courses of the module. The work load for courses with 6 credit points is about 180 hours, for courses with 4.5 credit points about 135 hours, for courses with 3 credit points about 90 hours, and for courses with 1.5 credit points about 45 hours. The total number of hours per course results from the time of visiting the lectures and exercises, as well as from the exam duration and the time that is required to achieve the objectives of the module as an average student with an average performance.

Learning type
The teaching and learning procedures (lecture, lab course, workshop) are described for each course of the module separately.

M 6.113 Module: Virtual Engineering A [M-MACH-101283]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	Deutsch	4	3

Mandatory			
T-MACH-102123	Virtual Engineering I	4 CR	Ovtcharova
Election block: Virtual Engineering A (at least 5 credits)			
T-MACH-109933	Business Administration for Engineers and IT professionals	4 CR	Maier
T-MACH-102185	CATIA CAD Training Course	2 CR	Ovtcharova
T-MACH-105312	CATIA Advanced	4 CR	Ovtcharova
T-MACH-108491	Digitalization of Products, Services & Production	4 CR	
T-MACH-102209	Information Engineering	3 CR	Ovtcharova
T-MACH-106743	IoT platform for engineering	4 CR	Ovtcharova
T-MACH-102153	PLM-CAD Workshop	4 CR	Ovtcharova
T-MACH-102181	PLM for Product Development in Mechatronics	4 CR	Eigner
T-MACH-106740	Virtual Engineering Lab	4 CR	Ovtcharova
T-MACH-106741	Virtual training factory 4.X	4 CR	Ovtcharova

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 should:

- have basic knowledge about the industrial application of Information Technology in product development,
- have understanding about current and future application of information systems in product development processes in the context of Product Lifecycle Management and Virtual Engineering,
- be able to operate current CAx- and PLM-systems in the product development process
- understands demands and relevance of interconnected IT-systems and respective methods for product development

Prerequisites
The course *Virtual Engineering I* [2121352] is compulsory modules and must be examined.

Content
The Module Virtual Engineering A gives an overview about product development processes, beginning with requirement engineering, verification of manufacturing feasibility and virtual operation in the scope of Digital Factory. The guest-lectures contained in this module complete the content of the lecture with introducing current product development processes focusing.

Workload
Workload at 9 graduate credits / credit points: ca. 270 hours.

- regular attendance: 100 hours
- Preparation and reworking: 50 hours
- Exam and exam revision/preparation: 120 hours

Detailed apportionment results from credit points of the courses of the module

Learning type
Lecture, exercise

M 6.114 Module: Virtual Engineering B [M-MACH-101281]

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

Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Each term	2 semester	Deutsch	4	3

Mandatory			
T-MACH-102124	Virtual Engineering II	4 CR	Ovtcharova
Election block: Virtual Engineering B (at least 5 credits)			
T-MACH-109933	Business Administration for Engineers and IT professionals	4 CR	Maier
T-MACH-102185	CATIA CAD Training Course	2 CR	Ovtcharova
T-MACH-105312	CATIA Advanced	4 CR	Ovtcharova
T-MACH-108491	Digitalization of Products, Services & Production	4 CR	
T-MACH-102209	Information Engineering	3 CR	Ovtcharova
T-MACH-106743	IoT platform for engineering	4 CR	Ovtcharova
T-MACH-102181	PLM for Product Development in Mechatronics	4 CR	Eigner
T-MACH-102153	PLM-CAD Workshop	4 CR	Ovtcharova
T-MACH-106740	Virtual Engineering Lab	4 CR	Ovtcharova
T-MACH-106741	Virtual training factory 4.X	4 CR	Ovtcharova

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 should:

- have basic knowledge about industrial practice of Information Technology in the field of product development,
- have basic knowledge about innovative visualization techniques like Virtual Reality and feasible application of Virtual Mock-Ups (VMU) for validating product properties.
- Is able to estimate potentials and risks of current Virtual Reality Systems in product development.
- understands demands and relevance of interconnected IT-systems and respective methods for product development

Prerequisites
keine

Content
The module Virtual Engineering B communicates basics of Virtual Reality applications and their fields of application for validating product properties and for supporting product development processes.

Optional courses of this module complete the content with practical application of VR techniques in product development (Virtual Reality Exercise) and current product development processes.

Workload
Workload at 9 graduate credits / credit points: ca. 270 hours.

- regular attendance: 100 hours
- Preparation and reworking: 50 hours
- Exam and exam revision/preparation: 120 hours

Detailed apportionment results from credit points of the courses of the module

Learning type
Lecture, Exercise.

M 6.115 Module: Water Chemistry and Water Technology I [M-CIWVT-101121]

Responsible: Prof. Dr. Harald Horn
Organisation: KIT Department of Chemical and Process Engineering
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

Credits	Recurrence	Duration	Language	Level	Version
9	Each winter term	1 semester	Deutsch/Englisch	4	1

Mandatory			
T-CIWVT-101900	Water Chemistry and Water Technology I	6 CR	Horn
T-CIWVT-103351	Laboratory Work Water Chemistry	4 CR	Abbt-Braun, Horn

Competence Goal
The student

- has knowledge of types and sum of the water constituents and their interaction with each other and with the water molecules,
- knows and understands the basics of water chemistry and the most important methods for the treatment of different types of raw water.

Prerequisites
none

Content
This module gives the basis to understand the most important methods of raw water treatment.

Therefore types and sum of water constituents and their interaction with each other and with water molecules are introduced. The effects of the different treatment and purification methods are shown

M 6.116 Module: Water Chemistry and Water Technology II [M-CIWVT-101122]

Responsible: Prof. Dr. Harald Horn
Organisation: KIT Department of Chemical and Process Engineering
Part of: Engineering Sciences
Compulsory Elective Modules (Ingenieurwissenschaften)

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

Mandatory			
T-CIWVT-101901	Water Chemistry and Water Technology II	9 CR	Horn

Competence Goal
The student

- has knowledge of types and sum of the water constituents and their interaction with each other and with the water molecules,
- knows and understands the basics of water chemistry and the most important methods for the treatment of different types of raw water.
- knows about the different types of water treatment and water purification methods to convert, reduce or concentrate water constituents,

Prerequisites
The Module "Water Chemistry and Water Technology I" must be passed.

Content
The effects of the different treatment and purification methods are shown and it is explained how they can convert, reduce or concentrate water constituents.

7 Courses

T 7.1 Course: Wildcard Key Competences Seminar 2 [T-WIWI-104681]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Studienleistung	2	1

T 7.2 Course: A closer look at Social Innovation [T-WIWI-109932]

Responsible: Dr. Daniela Beyer
Prof. Dr. Marion Weissenberger-Eibl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Irregular	1

Events					
SS 2019	2545105	Soziale Innovation unter die Lupe genommen	2 SWS	Seminar (S)	Beyer
Exams					
SS 2019	7900017	Soziale Innovationen unter die Lupe genommen		Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation). The grade consists of an innovation plan (comparable to an exposé) (15%), a guideline interview (25%), a presentation of the results (20%) and a seminar paper (40%).

Prerequisites
None

Recommendation
The previous attendance of the lecture Innovation Management is recommended.

T 7.3 Course: Advanced Game Theory [T-WIWI-102861]

Responsible: Prof. Dr. Karl-Martin Ehrhart
Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101500 - Microeconomic Theory
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
M-WIWI-104908 - Volkswirtschaftslehre

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

Events					
WS 18/19	2521533	Advanced Game Theory	2 SWS	Lecture (V)	Puppe, Ehrhart, Müller
WS 18/19	2521534	Übung zu Advanced Game Theory	1 SWS	Practice (Ü)	Müller, Puppe
Exams					
WS 18/19	7900232	Advanced Game Theory		Prüfung (PR)	Puppe

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

Prerequisites
None

Recommendation
Basic knowledge of mathematics and statistics is assumed.

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

V Advanced Game Theory

2521533, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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

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

T 7.4 Course: Advanced Lab Informatics [T-WIWI-103523]

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-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2512100	Security	4 SWS	Practical course (P)	Baumgart, Volkamer, Mayer
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	2512400	Entwicklung Soziotechnischer Informationssysteme	SWS	Practical course (P)	Sunyaev, Kromat
WS 18/19	2512501	Projektpraktikum Kognitive Automobile und Roboter	3 SWS	Practical course (P)	Zöllner
WS 18/19	2512600	Projektpraktikum Information Service Engineering	2 SWS	Practical course (P)	Sack
SS 2019	2512101	Praktikum Betriebliche Informationssysteme: Realisierung innovativer Dienste für Studierende	3 SWS	Practical course (P)	Oberweis, Toussaint, Ullrich
SS 2019	2512300	Knowledge Discovery and Data Mining	3 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Färber, Nguyen, Weller
SS 2019	2513306	Data Science & Real-time Big Data Analytics	2 SWS	Seminar / Practical course (S/P)	Sure-Vetter, Riemer, Zehnder
Exams					
WS 18/19	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
WS 18/19	7900046	Sicherheit		Prüfung (PR)	Volkamer
WS 18/19	7900094	Selected Topics in Text Mining - Cooperation Seminar AIFB and ECON		Prüfung (PR)	Sure-Vetter, Ott
WS 18/19	7900102	Advanced Lab Information Service Engineering		Prüfung (PR)	Sack
WS 18/19	7900107	Advanced Lab Cognitive Automobile and Robots		Prüfung (PR)	Zöllner
WS 18/19	7900115	Development of Sociotechnical Information Systems		Prüfung (PR)	Sunyaev
WS 18/19	7900192	Data Science with Open Data		Prüfung (PR)	Sure-Vetter

SS 2019	7900085	Advanced Lab in Information Systems: Realization of innovative services for students	Prüfung (PR)	Oberweis
SS 2019	7900094	Knowledge Discovery and Data Mining	Prüfung (PR)	Sure-Vetter

Competence Certificate
Advanced Lab "Privacy Friendly Apps":

The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of of a practical work in which a software functionality must be implemented and three interim submissions of the software to be developed. The weighting of the individual components will be announced during the first meeting.

All other courses of the Institute AIFB:

The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

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

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

Prerequisites
None

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

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

V **Security**
2512100, WS 18/19, 4 SWS, Open in study portal — **Practical course (P)**

Notes
More information on https://ilias.studium.kit.edu/goto.php?target=crs_719271&client_id=produktiv

V **Linked Data and the Semantic Web**
2512301, WS 18/19, 3 SWS, Open in study portal — **Seminar / Practical course (S/P)**

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** **Seminar / Practical course (S/P)**
2512311, WS 18/19, 3 SWS, Open in study portal

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** **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 **Entwicklung Soziotechnischer Informationssysteme** **Practical course (P)**
2512400, WS 18/19, SWS, Open in study portal

Description
The aim of this course is to provide a practical introduction into developing socio-technical information systems, such as web platforms, mobile apps, or desktop applications. Course participants will create (individually or in groups) software solutions for specific problems from various practical domains. The course tasks comprise requirements assessment, system design, and software implementation. Furthermore, course participants will gain insights into software quality assurance methods and software documentation.

Workload
4 ECTS = approx. 120 h

V Projektpraktikum Information Service Engineering
2512600, WS 18/19, 2 SWS, Open in study portal — **Practical course (P)**

Description
The project will be worked on in teams of 3-4 students each, guided by a tutor from the teaching staff. In the winter semester 2018/19 we intend to participate in the "Cod1ng Da V1nc1" Initiative .

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

Required coursework includes:

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

Notes
The ISEproject course can also be credited as a **seminar**.

The project will be worked on in teams of 3-4 students each, guided by a tutor from the teaching staff. In the winter semester 2018/19 we intend to participate in the "Cod1ng Da V1nc1" Initiative .

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.

T 7.5 Course: Advanced Lab Security [T-WIWI-109786]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

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

Events					
WS 18/19	2512100	Security	4 SWS	Practical course (P)	Baumgart, Volkamer, Mayer

Competence Certificate
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

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

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

Prerequisites
None

Recommendation
Knowledge from the lecture "Information Security" is recommended.

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

V Security
2512100, WS 18/19, 4 SWS, Open in study portal **Practical course (P)**

Notes
More information on https://ilias.studium.kit.edu/goto.php?target=crs_719271&client_id=produktiv

T 7.6 Course: Advanced Lab Security, Usability and Society [T-WIWI-108439]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

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

Events					
WS 18/19	2512551	Praktikum Security, Usability and Society	3 SWS	Practical course (P)	Volkamer, Mayer
Exams					
WS 18/19	7900116	Advanced Lab Security, Usability and Society		Prüfung (PR)	Volkamer

Competence Certificate
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

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

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

Prerequisites
None

Recommendation
Knowledge from the lecture "Information Security" is recommended.

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

Contents:

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

Learning goals:

The student

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

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

V Praktikum Security, Usability and Society

2512551, WS 18/19, 3 SWS, Open in study portal — **Practical course (P)**

Notes
Kick-off Meeting (compulsory attendance) 19.10.2018

T 7.7 Course: Advanced Lab User Studies in Security [T-WIWI-109271]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

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

Events					
SS 2019	2512552	Praktikum User Studies in Security and Privacy	3 SWS	Practical course (P)	Volkamer, Gerber, Mayer
Exams					
WS 18/19	7900129	Advanced Lab User Studies in Security		Prüfung (PR)	Volkamer
SS 2019	7900129	Advanced Lab User Studies in Security		Prüfung (PR)	Volkamer

Competence Certificate
The non examassessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

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

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

Prerequisites
None

T 7.8 Course: Advanced Machine Learning [T-WIWI-109921]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Dr. Abdolreza Nazemi

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540535	Advanced Machine Learning	2 SWS	Lecture (V)	Nazemi
SS 2019	2540536	Exercise Advanced Machine Learning	1 SWS	Practice (Ü)	Nazemi

Competence Certificate
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

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

V Advanced Machine Learning

2540535, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Tentative Course Outline:

- Introduction
- Statistical Inference
- Shrinkage Methods
- Model Assessment and Selection
- Tree-based Machine Learning Algorithms
- Dimensionality Reduction
- Neural Networks and Deep Learning
- Natural Language Processing with Deep Learning
- Support Vector Machine

Workload
Time of attendance

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

Literature

- Alpaydin, E. (2014). Introduction to Machine Learning. Third Edition, MIT Press.
- De Prado, M. L. (2018). Advances in Financial Machine Learning. John Wiley & Sons.
- Goodfellow, I., Bengio, Y., and A. Courville (2017). Deep Learning. MIT Press. (online available)
- Hastie, T., Tibshirani, R., and J. Friedman (2009). Elements of Statistical Learning. Second Edition. Springer. (online available)
- Leskovec, J., Rajaraman, A., Ullman, J. D., (2014). Mining of Massive Datasets. Cambridge University Press. (online available)
- Witten, I. H., Eibe, F., Hall, M. A., Pal, C. J. (2016). Data Mining: Practical Machine Learning Tools and Techniques. Morgan Kaufmann.

T 7.9 Course: Advanced Management Accounting [T-WIWI-102885]

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2579907	Advanced Management Accounting	3 SWS	Lecture (V)	Wouters, Riar
Exams					
WS 18/19	79-2579907-00	Advanced Management Accounting		Prüfung (PR)	Wouters

Competence Certificate
The assessment consists of an oral exam (20 min) taking place in the recess period (according to §4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None.

Recommendation
The course requires significant prior knowledge of Management Accounting, similar to the content of the courses MA 1 and 2, although completion of these particular courses is not a formal requirement.

Annotation
This course is held in English. Lectures and tutorials are integrated.

The course is compulsory and must be examined.

Students who are interested in attending this course should send an e-mail to Professor Wouters (marc.wouters∂kit.edu).

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

V Advanced Management Accounting

2579907, WS 18/19, 3 SWS, Open in study portal **Lecture (V)**

Learning Content
The course addresses several topics where management accounting is strongly related to marketing, finance, or organization and strategy, such as customer value propositions, financial performance measures, managing new product development, and technology investment decisions.

Annotation
This course is held in English. Students who are interested in attending this course should send an e-mail to Professor Wouters (marc.wouters?kit.edu).

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

Literature
Literature is mostly made available via ILIAS.

T 7.10 Course: Advanced Statistics [T-WIWI-103123]

Responsible: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101637 - Analytics und Statistik
M-WIWI-104902 - Statistik

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

Events					
WS 18/19	2550552	Statistik für Fortgeschrittene	2 SWS	Lecture (V)	Grothe
WS 18/19	2550553	Übung zu Statistik für Fortgeschrittene	2 SWS	Practice (Ü)	Grothe, Kaplan, Coblenz
Exams					
WS 18/19	7900219	Advanced Statistics		Prüfung (PR)	Grothe

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4). The exam is offered every semester. Re-examinations are offered only for repeaters.

Prerequisites
None

Annotation
New course starting winter term 2015/2016

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

V Statistik für Fortgeschrittene

2550552, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

Literature
Comprehensive lecture notes

T 7.11 Course: Advanced Stochastic Optimization [T-WIWI-106548]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

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

Prerequisites
None.

T 7.12 Course: Advanced Topics in Economic Theory [T-WIWI-102609]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101406 - Netzwerkökonomie
M-WIWI-101497 - Agglomeration und Innovation
M-WIWI-101500 - Microeconomic Theory
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
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 7.13 Course: Airport Logistics [T-MACH-105175]

Responsible: André Richter
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101263 - Einführung in die Logistik
M-MACH-101277 - Materialfluss in Logistiksystemen
M-MACH-101278 - Materialfluss in vernetzten Logistiksystemen
M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
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 7.14 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 7.15 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 7.16 Course: Analyzing and Evaluating Innovation Processes [T-WIWI-108774]

Responsible: Prof. Dr. Marion Weissenberger-Eibl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	1

Events					
WS 18/19	2545108	Innovationsprozesse analysieren und evaluieren	2 SWS	Seminar (S)	Beyer
Exams					
WS 18/19	7900037	Analyzing and Evaluating Innovation Processes		Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

Innovation plan (exposé) (20%), Guided interviews/ quantitative survey (20%), presentation of results (20%), seminar paper (about 5 pages per person) (40%).

Prerequisites
None

Recommendation
Prior attendance of the course Innovation Management [2545015] is recommended.

T 7.17 Course: Application of Social Science Methods (WiWi) [T-GEISTSOZ-109052]

Responsible: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: M-GEISTSOZ-101169 - Soziologie
M-WIWI-104906 - Geistes- und Sozialwissenschaften

Type	Credits	Recurrence	Version
Studienleistung schriftlich	9	Each summer term	1

Exams				
WS 18/19	7400048	Application of Social Science Methods (WiWi)	Prüfung (PR)	Nollmann

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-GEISTSOZ-104565 - Computer Aided Data Analysis must have been passed.

T 7.18 Course: Applied Econometrics [T-WIWI-103125]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101638 - Ökonometrie und Statistik I
M-WIWI-104902 - Statistik

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

Exams				
WS 18/19	7900251	Applied Econometrics	Prüfung (PR)	Schienle
WS 18/19	7900280	Applied Econometrics	Prüfung (PR)	Schienle

Competence Certificate
The assessment of this course is a written examination (90 min) according to §4(2), 1 of the examination regulation.

Prerequisites
None

Annotation
The course is not offered regularly.

T 7.19 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-101472 - 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

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 7.20 Course: Artificial Intelligence in Service Systems [T-WIWI-108715]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101448 - Service Management
M-WIWI-101506 - Service Analytics
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2595650	Artificial Intelligence in Service Systems	2 SWS	Lecture (V)	Kühl
Exams					
WS 18/19	7900253	Artificial Intelligence in Service Systems		Prüfung (PR)	Satzger

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

Prerequisites
None

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

V Artificial Intelligence in Service Systems

2595650, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Artificial Intelligence and the application of machine learning is becoming more and more popular to solve relevant business challenges. However, it is not only important to be familiar with precise algorithms, but rather a general understanding of the necessary steps with a holistic view—from real-world challenge to successful deployment of an AI. As part of this course, we teach the complete lifecycle of an AI project with a focus on supervised machine learning challenges. We do so by also teaching the use of Python and the required packages like scikit-learn and tensorflow with exemplary data. We then take this knowledge to the more complex case of service systems with different entities (e.g. companies) who interact with each other and show possibilities on how to derive holistic insights. Two possibilities to do so are the use of meta and transfer machine learning, where we teach insights in their theory, design and application.

T 7.21 Course: Asset Pricing [T-WIWI-102647]

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

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101480 - Finance 3
M-WIWI-101482 - Finance 1
M-WIWI-101483 - Finance 2
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2530555	Asset Pricing	2 SWS	Lecture (V)	Uhrig-Homburg
SS 2019	2530556	Übung zu Asset Pricing	1 SWS	Practice (Ü)	Uhrig-Homburg, Reichenbacher
Exams					
WS 18/19	7900056	Asset Pricing		Prüfung (PR)	Uhrig-Homburg

Competence Certificate
The success control takes place in form of a written examination (75 min) during the semester break (according to §4(2), 1 SPO).

The examination is offered every semester and can be repeated at any regular examination date.

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by 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 strongly recommend knowledge of the basic topics in investments (bachelor course), which will be necessary to be able to follow the course.

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

V Asset Pricing
2530555, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed

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

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

Literature
Basic literature

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

Elective literature

- Investments and Portfolio Management / Bodie, Z., Kane, A., Marcus, A.J. - 9. ed., McGraw-Hill, 2011.
- The econometrics of financial markets / Campbell, J.Y., Lo, A.W., MacKinlay, A.C. - 2. printing, with corrections, Princeton Univ. Press, 1997.

T 7.22 Course: Auction Theory [T-WIWI-102613]

Responsible: Prof. Dr. Karl-Martin Ehrhart
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101446 - Market Engineering
M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101500 - Microeconomic Theory
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2520408	Auktionstheorie	2 SWS	Lecture (V)	Ehrhart
WS 18/19	2520409	Übungen zu Auktionstheorie	1 SWS	Practice (Ü)	Ehrhart
Exams					
WS 18/19	7900222	Auction 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

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

V Auktionstheorie

2520408, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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

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

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

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

Literature

- Ehrhart , K.-M. und S. Seifert: Auktionstheorie, Skript zur Vorlesung, KIT, 2011
- Krishna, V.: Auction Theory, Academic Press, Second Edition, 2010
- Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2004
- Ausubel, L.M. und P. Cramton: Demand Reduction and Inefficiency in Multi-Unit Auctions, University of Maryland, 1999

T 7.23 Course: Automated Financial Advisory [T-WIWI-106495]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103261 - Disruptive Finanz-technologische Innovationen
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
WS 18/19	2500002	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
SS 2019	2530372	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
Exams					
WS 18/19	7900290	Automated Financial Advisory		Prüfung (PR)	Ulrich
SS 2019	7900124	Automated Financial Advisory		Prüfung (PR)	Ulrich

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

Prerequisites
There are two conditions for taking this course:

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-106193 - Engineering FinTech Solutions must have been started.
2. The course T-WIWI-106496 - Computational FinTech with Python and C++ must have been started.

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

V Automated Financial Advisory — Seminar (S)

2500002, WS 18/19, 2 SWS, Open in study portal

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

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Automated Financial Advisory — Seminar (S)

2530372, SS 2019, 2 SWS, Open in study portal

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

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

T 7.24 Course: Automated Manufacturing Systems [T-MACH-102162]

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

Part of: M-MACH-101298 - Automatisierte Produktionsanlagen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each summer term	2

Events					
SS 2019	2150904	Automated Manufacturing Systems	6 SWS	Lecture / Practice (VÜ)	Fleischer
Exams					
WS 18/19	76-T-MACH-102162	Automated Manufacturing Systems		Prüfung (PR)	Fleischer
WS 18/19	76-T-MACH-102162-MIT	Automated Manufacturing Systems		Prüfung (PR)	Fleischer

Competence Certificate
written exam (120 minutes)

Prerequisites
"T-MACH-108844 - Automatisierte Produktionsanlagen" must not be commenced.

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

V Automated Manufacturing Systems

2150904, 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
The lecture provides an overview of the structure and functioning of automated manufacturing systems. In the introduction chapter the basic elements for the realization of automated manufacturing systems are given. This includes:

- Drive and control technology
- Handling technology for handling work pieces and tools
- Industrial Robotics
- Quality assurance in automated manufacturing
- automatic machines, cells, centers and systems for manufacturing and assembly
- structures of multi-machine systems
- planning of automated manufacturing systems

An interdisciplinary view of these subareas enables Industry 4.0 solutions.
In the second part of the lecture, the basics are illustrated using implemented manufacturing processes for the production of automotive components (chassis and drive technology).The analysis of automated manufacturing systems for manufacturing of
defined components is also included.
In the field of vehicle power train both, the automated manufacturing process for the production of the conventional internal-combustion engine and the automated manufacturing process for the production of the prospective electric power train
(electric motor and battery) are considered. In the field of car body, the focus is on the analysis of the process chain for the automated manufacturing of conventional sheet metal body parts, as well as for automated manufacturing of body components made out of
fiber-reinforced plastics.
Within tutorials, the contents from the lecture are advanced and
applied to specific problems and tasks.

Annotation
None

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

Literature
Lecture Notes

T 7.25 Course: Automation of Discrete Event and Hybrid Systems [T-ETIT-100981]

Responsible: Prof. Dr.-Ing. Sören Hohmann
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101157 - Regelungstechnik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2303160	Automatisierung ereignisdiskreter und hybrider Systeme	2 SWS	Lecture (V)	Kluwe
Exams					
WS 18/19	7303160	Automation of Discrete Event and Hybrid Systems		Prüfung (PR)	Kluwe

Prerequisites
none

T 7.26 Course: Automotive Engineering I [T-MACH-100092]

Responsible: Prof. Dr. Frank Gauterin
Dr.-Ing. Hans-Joachim Unrau

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Expansion	Language	Version
Prüfungsleistung schriftlich	6	Each winter term	1 terms		2

Events					
WS 18/19	2113805	Automotive Engineering I	4 SWS	Lecture (V)	Gauterin, Unrau
WS 18/19	2113809	Automotive Engineering I	4 SWS	Lecture (V)	Gauterin, Gießler
Exams					
WS 18/19	76-T-MACH-100092	Automotive Engineering		Prüfung (PR)	Unrau, Gauterin
SS 2019	76-T-MACH-100092	Automotive Engineering		Prüfung (PR)	Gauterin, Unrau

Competence Certificate
Written examination

Duration: 120 minutes

Auxiliary means: none

Prerequisites
The brick "T-MACH-102203 - Automotive Engineering I" is not started or finished. The bricks "T-MACH-100092 - Grundlagen der Fahrzeugtechnik I" and "T-MACH-102203 - Automotive Engineering I" can not be combined.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102203 - Automotive Engineering I must not have been started.

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

V Automotive Engineering I

2113805, WS 18/19, 4 SWS, Open in study portal **Lecture (V)**

Learning Content
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performance, mechanics of longitudinal and lateral forces, active and passive safety

3. Drive systems: combustion engine, hybrid and electric drive systems

4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)

5. Power transmission and distribution: drive shafts, cardon joints, differentials

Workload
regular attendance: 45 hours
self-study: 195 hours

Literature
1. Mitschke, M. / Wallentowitz, H.: Dynamik der Kraftfahrzeuge, Springer Vieweg, Wiesbaden 2014

2. Pischinger, S. / Seiffert, U.: Handbuch Kraftfahrzeugtechnik, Springer Vieweg, Wiesbaden 2016

3. Gauterin, F. / Unrau, H.-J. / Gnadler, R.: Script to the lecture 'Grundlagen der Fahrzeugtechnik I', KIT, Institute of Vehicle System Technology, Karlsruhe, annual update

V Automotive Engineering I

2113809, WS 18/19, 4 SWS, Open in study portal

Lecture (V)

Notes
In English language.

Learning Content
1. History and future of the automobile

2. Driving mechanics: driving resistances and driving performances, mechanics of longitudinal and lateral forces, active and passive safety

3. Drive systems: combustion engine, hybrid and electric drive systems

4. Transmission: clutches (e.g. friction clutch, visco clutch), transmission (e.g. mechanical transmission, hydraulic fluid transmission)

5.Power transmission and distribution: drive shafts, cardon joints, differentials

Workload
regular attendance: 45 hours
self-study: 195 hours

Literature
1. Robert Bosch GmbH: Automotive Handbook, 9th edition, Wiley, Chichister 2015

2. Onori, S. / Serrao, L: / Rizzoni, G.: Hybrid Electric Vehicles - Energy Management Strategies, Springer London, Heidelberg, New York, Dordrecht 2016

3. Reif, K.: Brakes, Brake Control and Driver Assistance Systems - Function, Regulation and Components, Springer Vieweg, Wiesbaden 2015

4. Gauterin, F. / Gießler, M. / Gnadler, R.: Script to the lecture 'Automotive Engineering I', KIT, Institute of Vehicle System Technology, Karlsruhe, annual update

T 7.27 Course: Automotive Engineering II [T-MACH-102117]

Responsible: Prof. Dr. Frank Gauterin
Dr.-Ing. Hans-Joachim Unrau

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2114835	Automotive Engineering II	2 SWS	Lecture (V)	Unrau
SS 2019	2114855	Automotive Engineering II	2 SWS	Lecture (V)	Gießler
Exams					
WS 18/19	76-T-MACH-102117	Automotive Engineering II		Prüfung (PR)	Unrau, Gauterin
WS 18/19	76T-MACH-102117-2	Automotive Engineering II		Prüfung (PR)	Gauterin, Unrau
SS 2019	76-T-MACH-102117	Automotive Engineering II		Prüfung (PR)	Unrau, Gauterin

Competence Certificate
Written Examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
none

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

V Automotive Engineering II

2114835, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of designs

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
1. Heißing, B. / Ersoy, M.: Fahrwerkhandbuch: Grundlagen, Fahrdynamik, Komponenten, Systeme, Mechatronik, Perspektiven, Springer Vieweg, Wiesbaden, 2013

2. Breuer, B. / Bill, K.-H.: Bremsenhandbuch: Grundlagen - Komponenten - Systeme - Fahrdynamik, Springer Vieweg, Wiesbaden, 2017

3. Unrau, H.-J. / Gnadler, R.: Script to the lecture 'Grundlagen der Fahrzeugtechnik II', KIT, Institute of Vehicle System Technology, Karlsruhe, annual update

V

Automotive Engineering II

2114855, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Learning Content

1. Chassis: Wheel suspensions (rear axles, front axles, kinematics of axles), tyres, springs, damping devices
2. Steering elements: Manual steering, servo steering, steer by wire
3. Brakes: Disc brake, drum brake, comparison of the designs

Literature

Elective literature:

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichester 2015
2. Heißing, B. / Ersoy, M.: Chassis Handbook - fundamentals, driving dynamics, components, mechatronics, perspectives, Vieweg+Teubner, Wiesbaden 2011
3. Gießler, M. / Gnadler, R.: Script to the lecture "Automotive Engineering II", KIT, Institut of Vehicle System Technology, Karlsruhe, annual update

T 7.28 Course: Automotive Logistics [T-MACH-105165]

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

Part of:
M-MACH-101263 - Einführung in die Logistik
M-MACH-101277 - Materialfluss in Logistiksystemen
M-MACH-101278 - Materialfluss in vernetzten Logistiksystemen
M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
M-MACH-101282 - Globale Produktion und 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 7.29 Course: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]

Responsible: Gerd Gutekunst
Prof. Dr. Berthold Wigger

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101511 - Vertiefung Finanzwissenschaft
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 7.30 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-101263 - Einführung in die Logistik
M-MACH-101279 - 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 7.31 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I [T-MACH-100966]

Responsible: Prof. Dr. Andreas Guber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101290 - BioMEMS
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	2

Events					
WS 18/19	2141864	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I	2 SWS	Lecture (V)	Guber
Exams					
WS 18/19	76-T-MACH-100966	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I		Prüfung (PR)	Guber
SS 2019	76-T-MACH-100966	BioMEMS - Microsystems Technologies for Life-Sciences and Medicine I		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 I

2141864, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:
Lecture script

Learning Content
Introduction into various microtechnical manufacturing methods: LIGA, Micro milling, Silicon Micromachining, Laser Microstructuring, µEDM, Metal-Etching
Biomaterials, Sterilisation.
Examples of use in the life science sector: basic micro fluidic strucutures: micro channels, micro filters, micromixers, micropumps, microvalves, Micro and nanotiter plates, Microanalysis systems (µTAS),
Lab-on-chip applications.

Annotation
The exam is held during the semester break. The date will be announced at the beginning of the semester.

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

M. Madou
Fundamentals of Microfabrication
Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T 7.32 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-MACH-101290 - BioMEMS
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

2142883, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
Lecture script

Learning Content
Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:
LabCD, Protein Cristallisation
Microarrys
Tissue Engineering
Cell Chip Systems
Drug Delivery Systems
Micro reaction technology
Microfluidic Cells for FTIR-Spectroscopy
Microsystem Technology for Anesthesia, Intensive Care and Infusion
Analysis Systems of Person´s Breath
Neurobionics and Neuroprosthesis
Nano Surgery

Workload
Literature: 20 h

Lessions: 21 h

Preparation and Review: 50 h

Exam preparation: 30 h

Literature
Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

Buess, G.: Operationslehre in der endoskopischen Chirurgie, Band I und II;
Springer-Verlag, 1994

M. Madou
Fundamentals of Microfabrication

T 7.33 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-MACH-101290 - BioMEMS
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 7.34 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-MACH-101290 - BioMEMS
M-MACH-101294 - Nanotechnologie
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 7.35 Course: Blockchains & Cryptofinance [T-WIWI-108880]

Responsible: Dr. Philipp Schuster
Prof. Dr. Marliese Uhrig-Homburg

Organisation: KIT Department of Economics and Management

Part of:
M-WIWI-101409 - Electronic Markets
M-WIWI-101446 - Market Engineering
M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-101511 - Vertiefung Finanzwissenschaft
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2530567	Blockchains & Cryptofinance	2 SWS	Lecture (V)	Schuster, Uhrig-Homburg
WS 18/19	2530568	Übung zu Blockchains & Cryptofinance	1 SWS	Practice (Ü)	Müller
Exams					
WS 18/19	7900028	Blockchains & Cryptofinance		Prüfung (PR)	Uhrig-Homburg

Competence Certificate
The assessment consists of a written exam (75 min) (§4(2), 1 of the examination regulations).

Prerequisites
None

Recommendation
None

Annotation
New course starting winter term 2018/2019.

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

V Blockchains & Cryptofinance

2530567, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Workload
Gesamtaufwand bei 4,5 Leistungspunkten: ca. 135.0 Stunden

Präsenzzeit: 30 Stunden

Vor – und Nachbereitung der LV: 45.0 Stunden

Prüfung und Prüfungsvorbereitung: 60.0 Stunden

T 7.36 Course: Building Intelligent and Robo-Adviced Portfolios [T-WIWI-106442]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103247 - Intelligente Risiko- und Investitionsberatung
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each summer term	1

Competence Certificate
No exam in winter semester 2018/2019.

The exam tests the material of the current semester and takes place during the lecture-free period. Students who don't pass the exam are allowed to re-take the exam.

Details of the grade formation will be announced at the beginning of the event.

Prerequisites
None.

Recommendation
Good skills in applied math modeling (differential equations).

Annotation
The course is not offered regularly.

T 7.37 Course: Building Laws [T-BGU-103429]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6241803	Baurecht	2 SWS	Lecture (V)	Miernik, Kohlhammer
Exams					
WS 18/19	8240103429	Building Laws		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.38 Course: BUS-Controls [T-MACH-102150]

Responsible: Simon Becker
Prof. Dr.-Ing. Marcus Geimer

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-MACH-101267 - Mobile Arbeitsmaschinen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	2

Events					
SS 2019	2114092	BUS-Controls	2 SWS	Lecture (V)	Geimer, Daiß
Exams					
WS 18/19	76T-MACH-102150	BUS-Controls		Prüfung (PR)	Geimer
SS 2019	76T-MACH-102150	BUS-Controls		Prüfung (PR)	Geimer

Competence Certificate
The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
Required for the participation in the examination is the preparation of a report during the semester. The partial service with the code T-MACH-108889 must have been passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-108889 - BUS-Controls - Advance must have been passed.

Recommendation
Basic knowledge of electrical engineering is recommended. Programming skills are also helpful.

The number of participants is limited. A registration in mandatory, the details will be announced on the webpages of the *Institute of Vehicle System Technology / Institute of Mobile Machines.* In case of too many applications, attendance will be granted based on pre-qualification.

Annotation
The students will get an overview of the theoretic and practical functioning of different bus systems.

After the practical oriented lessons the students will be able to visualize the communication structure of different applications, design basic systems and evaluate the complexity of programming of the complete system.
Hereunto the students program in the practical orientated lessons IFM-controllers using the programming environment CoDeSys.

Content:

- Knowledge of the basics of data communication in networks
- Overview of the operating mode of current field buses
- Explicit observation of the operating mode and application areas of CAN buses
- Practical programming of an example application (hardware is provided)

Literature:

- Etschberger, K.: Controller Area Network, Grundlagen, Protokolle, Bausteine, Anwendungen; München, Wien: Carl Hanser Verlag, 2002.
- Engels, H.: CAN-Bus - CAN-Bus-Technik einfach, anschaulich und praxisnah dargestellt; Poing: Franzis Verlag, 2002.

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

V **BUS-Controls** **Lecture (V)**
2114092, SS 2019, 2 SWS, Open in study portal

Learning Content

- Knowledge of the basics of data communication in networks
- Overview of the operating mode of current field buses
- Explicit observation of the operating mode and application areas of CAN buses
- Practical programming of an example application (hardware is provided)

Annotation
The course will be replenished by interesting lectures of professionals.

Workload

- regular attendance: 21 hours
- self-study: 92 hours

Literature
Elective literature:

- Etschberger, K.: Controller Area Network, Grundlagen, Protokolle, Bausteine, Anwendungen; München, Wien: Carl Hanser Verlag, 2002.
- Engels, H.: CAN-Bus - CAN-Bus-Technik einfach, anschaulich und praxisnah dargestellt; Poing: Franzis Verlag, 2002.

T 7.39 Course: BUS-Controls - Advance [T-MACH-108889]

Responsible: Kevin Daiß
Prof. Dr.-Ing. Marcus Geimer

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	0	Each summer term	1

Competence Certificate
Creation of control program

Prerequisites
none

T 7.40 Course: Business Administration for Engineers and IT professionals [T-MACH-109933]

Responsible: Dipl.-Ing. Thomas Maier
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
SS 2019	2122303	Business Administration for Engineers and IT professionals	2 SWS	Seminar (S)	Sebregondi

Competence Certificate
Assessment of another type. Two presentations and six written compositions in team work. Grading: each composition 1/8 and each presentation 1/8.

Prerequisites
None

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

V Business Administration for Engineers and IT professionals

2122303, SS 2019, 2 SWS, Open in study portal **Seminar (S)**

Notes
Number of participants limited to 30 people.

T 7.41 Course: Business Administration in Information Engineering and Management [T-WIWI-102886]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101409 - Electronic Markets
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2540500	Business Administration in Information Engineering and Management	2 SWS	Lecture (V)	Geyer-Schulz
SS 2019	2540501	Übungen zu BWL der Informationsunternehmen	1 SWS	Practice (Ü)	Nazemi
Exams					
WS 18/19	7979537	Business Administration in Information Engineering and 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

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

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

V Business Administration in Information Engineering and Management

2540500, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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

Workload
The total workload for this course is approximately 150 hours (5 credits):

Time of attendance

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

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 40h 00m
- Preparation of the examination: 31h 00m

Sum: 150h 00m

Literature

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

T 7.42 Course: Business and IT Service Management [T-WIWI-102881]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101448 - Service Management
M-WIWI-102754 - Service Economics and Management
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2595484	Business and IT Service Management	2 SWS	Lecture (V)	Satzger
WS 18/19	2595485	Übungen zu Business and IT Service Management	1 SWS	Practice (Ü)	Enders, Seebacher
Exams					
WS 18/19	7900242	Business and IT Service Management		Prüfung (PR)	Satzger

Competence Certificate
The assessment of this course is a written examination (60 min.) (following §4(2), 1 SPOs) and by submitting written papers as part of the exercise (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Prerequisites
None

Recommendation
None

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

V Business and IT Service Management

2595484, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The rapid development of information and communication technology transforms many enterprises towards service-oriented structures, comprising new digital services, new business models and SOA-based process structures within larger service networks. Thus, strategic and operative management of service-oriented enterprises increasingly gains importance. In this course, we want to systematically acquire relevant know-how and apply this to real word examples. Focus will be placed on the interdependencies of business, IT aspects and concepts.

The course will be taught in English. It should provide ample opportunity for active participation of students. The course will integrate presentations of experts from business practice as well as a comprehensive case study ('en bloc' for 1-2 days) in which students will actively work on the strategic service-oriented shift of an enterprise.

Annotation
The credits have been changed from 5 to 4,5.

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

Literature

Fitzsimmons J./Fitzsimmons, M., Service Management, Operations, Strategy and Information Technology, 6. ed., 2007

Maister, David H., Managing The Professional Service Firm, 1997

Teboul, J. , Service is Front Stage: Positioning services for value advantage, 2006

Grönroos, Service Management and Marketing, 2007

Cardoso et al. (Hrsg.) (2015), Fundamentalson Service Systems

Böhmann et al. (2014), Service Systems Engineering, Business & Information Systems Engineering, Vol. 6, No.2, 73-79
Vargo, S./Lusch, R. (2004) Evolving to a New Dominant Logic for Marketing, in: JoM68 (1),1–17
Schüritz et al., (2017):Datatizationas the Next Frontier of Servitization,ICIS Proceedings

T 7.43 Course: Business Data Analytics: Application and Tools [T-WIWI-109863]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103117 - Data Science: Data-Driven Information Systems
M-WIWI-103118 - Data Science: Data-Driven User Modeling
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540466	Business Data Analytics: Application and Tools	2 SWS	Lecture (V)	Weinhardt, Dann, Staudt
SS 2019	2540467	Excercise Business Data Analytics: Application and Tools	1 SWS	Practice (Ü)	Haubner, Dann, Frankenhauser, Staudt

Competence Certificate
Assessment consists of a written exam ofone hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

Students receive one aggregated grade consisting of a written exam (60%) and the Analytics Challenge (40%). The exam and the Analytics Challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Analytics challenge.

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-108438 - Applied Analytics with Open Source Tools must not have been started.

Recommendation
Knowledge of object-oriented programming and statistics is helpful.

Annotation
Course name until winter semester 2018/2019 "Applied Analytics with Open Source Tools" (T-WIWI-108438)

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

V Business Data Analytics: Application and Tools

2540466, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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

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

Content:

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

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

T 7.44 Course: Business Data Strategy [T-WIWI-106187]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103117 - Data Science: Data-Driven Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540484	Business Data Strategy	2 SWS	Lecture (V)	Weinhardt
WS 18/19	2540485	Übung zu Business Data Strategy	1 SWS	Practice (Ü)	Weinhardt, Knierim
Exams					
WS 18/19	7900226	Business data strategy		Prüfung (PR)	Weinhardt
WS 18/19	7900234	Business Data Strategy		Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulationand an alternative exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation. The grade isdetermined by 2/3 through the written exam and by 1/3 through the alternative exam assessment (e.g., presentation).

Prerequisites
None

Recommendation
Students should be familiar with basic concepts of business organisations, information systems, and programming. However, all material will be introduced, so no formal pre-conditions are applied.

Annotation
Limited number of participants.

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

V Business Data Strategy

2540484, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
With new methods for capturing and using different types of data and industry's recognition that society's use of data is less than optimal, the need for comprehensive strategies is more important than ever before. Advances in cybersecurity and information sharing and the use of data in its raw form for decision making all add to the complexity of integrated processes, ownership, stewardship, and sharing. The life cycle of data in its entirety spans the infrastructure, system design, development, integration, and implementation of information-enabling solutions. This lecture focuses on teaching about these dynamics and tools to comprehend and manage them in organisation contexts. Given the increasing size and complexity of data, methods for the transformation and structured preparation are an important tool in the process of sense–making. Modern software solutions and programming languages provide frameworks for such tasks that form another part of this course ranging from conceptual systems modelling to data manipulation to automated generation of HTML reports and web-applications.

Literature

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

T 7.45 Course: Business Dynamics [T-WIWI-102762]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101409 - Electronic Markets
M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540531	Business Dynamics	2 SWS	Lecture (V)	Geyer-Schulz, Glenn
WS 18/19	2540532	Exercise Business Dynamics	1 SWS	Practice (Ü)	Geyer-Schulz, Glenn
Exams					
WS 18/19	7979777	Business Dynamics		Prüfung (PR)	Geyer-Schulz

Competence Certificate
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

Recommendation
None

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

V Business Dynamics

2540531, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

Annotation
The course is generally held as block course.

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

Time of attendance

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

Self-study

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

Sum: 135h 00m

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

T 7.46 Course: Business Intelligence Systems [T-WIWI-105777]

Responsible: Prof. Dr. Alexander Mädche
Mario Nadj
Peyman Toreini

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101506 - Service Analytics
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-103117 - Data Science: Data-Driven Information Systems
M-WIWI-104068 - Information Systems in Organizations
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540422	Business Intelligence Systems	2 + 1 SWS	Lecture (V)	Mädche, Nadj
Exams					
WS 18/19	7900224	Business Intelligence Systems		Prüfung (PR)	Mädche

Competence Certificate
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and the Business Intelligence System challenge (40%). The exam and the Business Intelligence System challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Business Intelligence System challenge.

Prerequisites
None

Recommendation
Basic knowledge on database systems is helpful.

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

V Business Intelligence Systems

2540422, WS 18/19, 2 + 1 SWS, Open in study portal — **Lecture (V)**

Description
In most modern enterprises, Business Intelligence Systems represent a core enabler of managerial decision making in that they are supplying up-to-date and accurate information about all relevant aspects of a company's planning and operations: from stock levels to sales volumes, from process cycle times to key indicators of corporate performance.

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

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

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

Watson, H. J. 2014. “Tutorial: Big Data Analytics: Concepts, Technologies, and Applications,” Communications of the Association for Information Systems (34), p. 24.

Arnott, D., and Pervan, G. 2014. “A critical analysis of decision support systems research revisited: The rise of design science,” Journal of Information Technology (29:4), Nature Publishing Group, pp. 269–293 (doi: 10.1057/jit.2014.16).

Carlo, V. (2009). “Business intelligence: data mining and optimization for decision making”. Editorial John Wiley and Sons, 308-317.

Chen, H., Chiang, R. H. L, and Storey, V. C. 2012. „Business Intelligence and Analytics: From Big Data to Big Impact,“ MIS Quarterly (36:4), pp. 1165-1188.

Davenport, T. 2014. Big Data @ Work, Boston, MA: Harvard Business Review.

Economist Intelligence Unit. 2015 “Big data evolution: Forging new corporate capabilities for the long term”

Power, D. J. 2008. “Decision Support Systems: A Historical Overview,” Handbook on Decision Support Systems, pp. 121–140 (doi: 10.1007/978-3-540-48713-5_7).

Sharma, R., Mithras, S., and Kankanhalli, A. 2014. „Transforming decision-making processes: a research agenda for understanding the impact of business analytics on organisations,“ European Journal of Information Systems (23:4), pp. 433-441.

Silver, M. S. 1991. “Decisional Guidance for Computer-Based Decision Support,” MIS Quarterly (15:1), pp. 105-122.

T 7.47 Course: Business Models in the Internet: Planning and Implementation [T-WIWI-102639]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-102806 - Service Innovation, Design & Engineering
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540456	Internet Business Models	2 SWS	Lecture (V)	Weinhardt, Peukert, Dann
SS 2019	2540457	Übungen zu Geschäftsmodelle im Internet: Planung und Umsetzung	1 SWS	Practice (Ü)	Peukert, Dann

Competence Certificate
The assessment consists of a written exam (60 min) (according to §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). 50% of the final grade is based on the written exam and 50% is based on assignments from the exercises. Successful completion of the exercises is a prerequisite for admission to the written exam. The points obtained in the exercises only apply to the first and second exam of the semester in which they were obtained.

Prerequisites
None

Recommendation
None

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

V Internet Business Models

2540456, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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

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

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

Literature
Will be announced within the course.

T 7.48 Course: Business Planning [T-WIWI-102865]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2545007	Business Planning for Founders (ENTECH)	2 SWS	Seminar (S)	Wohlfeil, Bauman, Terzidis
SS 2019	2545005	Geschäftsplanung für Gründer (Track 1)	2 SWS	Seminar (S)	Terzidis, Tittel, Ntagiakou
Exams					
WS 18/19	7900023	Business Planning for Founders		Prüfung (PR)	Terzidis

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
None

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

V Geschäftsplanung für Gründer (Track 1)

2545005, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

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

T 7.49 Course: Business Process Modelling [T-WIWI-102697]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511210	Business Process Modelling	2 SWS	Lecture (V)	Drescher, Oberweis
WS 18/19	2511211	Übung zu Modellierung von Geschäftsprozessen	1 SWS	Practice (Ü)	Drescher, Koschmider
Exams					
WS 18/19	7900015	Business Process Modelling		Prüfung (PR)	Oberweis
SS 2019	7900047	Business Process Modelling		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites
None

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

V Business Process Modelling

2511210, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The proper modeling of relevant aspects of business processes is essential for an efficient and effective design and implementation of processes. This lecture presents different classes of modeling languages and discusses the respective advantages and disadvantages of using actual application scenarios. For that simulative and analytical methods for process analysis are introduced. In the accompanying exercise the use of process modeling tools is practiced.

Workload
Lecture 30h
Exercise 15h

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

Total: 150h

Literature

- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer 2012.
- F. Schönthaler, G.Vossen, A. Oberweis, T. Karl: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer 2012.

Further Literature will be given in the lecture.

T 7.50 Course: Business Strategies of Banks [T-WIWI-102626]

Responsible: Prof. Dr. Wolfgang Müller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
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 7.51 Course: Case Studies in Sales and Pricing [T-WIWI-102834]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	1,5	Each winter term	3

Events					
WS 18/19	2572182	Case Studies in Sales and Pricing	1 SWS	Block (B)	Klarmann, Assistenten
Exams					
WS 18/19	7900153	Case Studies in Sales and Pricing		Prüfung (PR)	Klarmann

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of a group presentation with a subsequent round of questions totalling 30 minutes.

Prerequisites
None

Recommendation
None

Annotation
Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the research group Marketing & Sales (marketing.iism.kit.edu).
Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed.
For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).
Please note that only one of the 1.5-ECTS courses can be attended in this module.

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

V Case Studies in Sales and Pricing

2572182, WS 18/19, 1 SWS, Open in study portal **Block (B)**

Learning Content
Students work in groups on case studies from the field of sales and pricing. The case studies contain quantitative calculations in the context of sales and pricing as well as tasks which are to be solved by logical reasoning. When solving the case studies, theoretical sales and pricing content is applied to practical problems. Finally, the results are presented by the group and discussed.

Annotation

- The final presentations can be held in German or English.
- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.
- Please note that only one of the 1.5-ECTS courses can be chosen in the Sales Management Module.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

Workload
Total work load for 1.5 ECTS: ca. 45 hours

Literature

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

T 7.52 Course: Case Studies Seminar: Innovation Management [T-WIWI-102852]

Responsible: Prof. Dr. Marion Weissenberger-Eibl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	1

Events					
WS 18/19	2545105	Case studies seminar: Innovation management	2 SWS	Seminar (S)	Weissenberger-Eibl
Exams					
WS 18/19	7900237	Case Studies Seminar: Innovation Management		Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
Prior attendance of the course *Innovation Management* [2545015] is recommended.

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

V Case studies seminar: Innovation management

2545105, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Learning Content
The objective of the seminar is to master selected concepts and methods of innovation management and then to apply these practically. Working in groups, the students apply the described concepts and methods of innovation management to a case study from the automotive industry to answer specific questions. Accordingly, the block seminar involves a switch from input to the application of this input. At the end, the results of the group work are presented in the form of a seminar paper and discussed by the whole course.

A short introduction to presentation techniques is planned to help students prepare the seminar papers.

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

T 7.53 Course: CATIA Advanced [T-MACH-105312]

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

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2123380	CATIA für Fortgeschrittene	3 SWS	Project (PRO)	Ovtcharova, Mitarbeiter
SS 2019	2123380	CATIA advanced	3 SWS	Project (PRO)	Ovtcharova, Mitarbeiter

Competence Certificate
Assessment of another type. Design project and written documentation in team work and final presentation. Grading: Project work 3/5, documentation 1/5 and presentation 1/5.

Prerequisites
none

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

V CATIA advanced

2123380, SS 2019, 3 SWS, Open in study portal **Project (PRO)**

Learning Content

- Use of advanced CAD techniques and CATIA functionalities
- Management of data using the PLM system SmarTeam
- Design engineering with CAD
- Integration of partial solutions into the overall solution
- Ensuring the reusability of CAD models through parameterization and cataloging
- Validation, strength tests (FEM analysis)
- Kinematic simulation with the digital mockup (DMU Kinematics)
- Production with integrated CAM tool
- Animations
- Presentation of results at the end of the semester

Annotation
For the workshop compulsory attendance exists.

Workload
regular attendance: 21 hours, self-study: 35 hours

T 7.54 Course: CATIA CAD Training Course [T-MACH-102185]

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

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung praktisch	2	Each term	2

Events					
WS 18/19	2123358	CATIA CAD training course	2 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
SS 2019	2123358	CATIA CAD training course	3 SWS	Practical course (P)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102185	CATIA CAD 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 attendance is compulsory.

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

V CATIA CAD training course

2123358, WS 18/19, 2 SWS, Open in study portal **Practical course (P)**

Learning Content
The participant will learn the following knowledge:

- Basics of CATIA such as user interface, handling etc.
- Production and processing of different model types
- Production of basic geometries and parts
- Generation of detailed drawings
- Integration of partial solutions in modules
- Working with constrains
- Strength analysis with FEM
- Kinematic simulation with DMU
- Dealing with CATIA Knowledgeware

Annotation
For the practical course attendance is compulsory.

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

Literature
practical course skript

V

CATIA CAD training course

2123358, SS 2019, 3 SWS, Open in study portal

Practical course (P)

Learning Content
The participant will learn the following knowledge:

- Basics of CATIA such as user interface, handling etc.
- Production and processing of different model types
- Production of basic geometries and parts
- Generation of detailed drawings
- Integration of partial solutions in modules
- Working with constrains
- Strength analysis with FEM
- Kinematic simulation with DMU
- Dealing with CATIA Knowledgeware

Annotation
For the practical course attendance is compulsory.

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

Literature
practical course skript

T 7.55 Course: Ceramic Processing Technology [T-MACH-102182]

Responsible: Dr. Joachim Binder
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2126730	Ceramics Processing	2 SWS	Lecture (V)	Binder
Exams					
WS 18/19	76-T-MACH-102182	Ceramic Processing Technology		Prüfung (PR)	Wagner

Competence Certificate
The assessment consists of an oral exam (approx. 20 min) taking place at the agreed date.

Auxiliary means: none

The re-examination is offered upon agreement.

Prerequisites
none

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

V Ceramics Processing

2126730, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The course imparts technological basics for processing of engineering ceramics. The course is arranged in the following units:

- Synthesis methods
- Powder conditioning and mixing methods
- Forming of ceramics
- Sintering
- Finishing processes
- Ceramic films and multi-layer systems
- Effects of processing on properties

Workload
regular attendance: 21 hours

self-study: 99 hours

Literature
W. Kollenberg: Technische Keramik, Vulkan Verlag 2010.

M. N. Rahaman: Ceramic Processing, CRC Taylor & Francis, 2007.

D.W. Richerson: Modern ceramic engineering, CRC Taylor & Francis, 2006.

A. G. King: Ceramic Technology and Processing, William Andrew, 2002.

T 7.56 Course: Challenges in Supply Chain Management [T-WIWI-102872]

Responsible: Esther Mohr
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102805 - Service Operations
M-WIWI-102808 - Digital Service Systems in Industry
M-WIWI-104899 - Operations Research

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

Events					
SS 2019	2550494	Challenges in Supply Chain Management	3 SWS	Lecture (V)	Mohr

Competence Certificate
The assessment consists of a written paper and an oral exam of ca. 30-40 min (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

Prerequisites
None

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

Annotation
The number of course participants is limited to 12 participants due to joint work in BASF project teams. Due to these capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is offered irregularly. The planned lectures and courses for the next three years are announced online.

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

V Challenges in Supply Chain Management

2550494, SS 2019, 3 SWS, Open in study portal **Lecture (V)**

Learning Content
The course consists of case studies of BASF which cover future challenges of supply chain management. Thus, the course aims at a case-study based presentation, critical evaluation and exemplary discussion of recent questions in supply chain management. The focus lies on future challenges and trends, also with regard to their applicability in practical cases (especially in the chemical industry).

The main part of the course is working on a project together with BASF in Ludwigshafen. The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the project topic.

This course will include working on cutting edge supply chain topics like Industry 4.0 / “Internet of Everything in production”, supply chain analytics, risk management, procurement and production in SCM. The team essays / project reports will be linked to industry-related challenges as well as to upcoming theoretical concepts. The topics of the seminar will be announced at the beginning of the term in a preliminary meeting.

Annotation
The number of course participants is limited to 12 participants due to joint work in BASF project teams. Due to these capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is offered irregularly. The planned lectures and courses for the next three years are announced online.

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

Literature
To be defined depending on the topic.

T 7.57 Course: Characteristics of Transportation Systems [T-BGU-106609]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	6232806	Eigenschaften von Verkehrsmitteln	2 SWS	Lecture (V)	Vortisch
Exams					
WS 18/19	8240106609	Characteristics of Transportation Systems		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.58 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 7.59 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 7.60 Course: Communication Systems and Protocols [T-ETIT-101938]

Responsible: Prof. Dr.-Ing. Jürgen Becker
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2311616	Communication Systems and Protocols	2 SWS	Lecture (V)	Becker, Becker
SS 2019	2311618	Übungen zu 2311616 Communication Systems and Protocols	1 SWS	Practice (Ü)	Nidhi
Exams					
WS 18/19	7311616	Communication Systems and Protocols		Prüfung (PR)	Becker

Prerequisites
none

T 7.61 Course: Competition in Networks [T-WIWI-100005]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101406 - Netzwerkökonomie
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 7.62 Course: Computational Economics [T-WIWI-102680]

Responsible: Dr. rer. nat. Pradyumn Kumar Shukla
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	2

Events					
WS 18/19	2590458	Computational Economics	2 SWS	Lecture (V)	Shukla
WS 18/19	2590459	Übungen zu Computational Economics	1 SWS	Practice (Ü)	Shukla
Exams					
WS 18/19	7900005	Computational Economics		Prüfung (PR)	Shukla
SS 2019	7900030	Computational Economics		Prüfung (PR)	Shukla

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulation). 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). The bonus only applies to the first and second exam of the semester in which it was obtained.

Prerequisites
None

Annotation
The credits have been changed to 5 starting summer term 2016.

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

V Computational Economics

2590458, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Examining complex economic problems with classic analytical methods usually requires making numerous simplifying assumptions, for example that agents behave rationally or homogeneously. Recently, widespread availability of computing power gave rise to a new field in economic research that allows the modeling of heterogeneity and forms of bounded rationality: Computational Economics. Within this new discipline, computer based simulation models are used for analyzing complex economic systems. In short, an artificial world is created which captures all relevant aspects of the problem under consideration. Given all exogenous and endogenous factors, the modelled economy evolves over time and different scenarios can be analyzed. Thus, the model can serve as a virtual testbed for hypothesis verification and falsification.

Literature

- R. Axelrod: "Advancing the art of simulation in social sciences". R. Conte u.a., Simulating Social Phenomena, Springer, S. 21-40, 1997.
- R. Axtel: "Why agents? On the varied motivations for agent computing in the social sciences". CSED Working Paper No. 17, The Brookings Institution, 2000.
- K. Judd: "Numerical Methods in Economics". MIT Press, 1998, Kapitel 6-7.
- A. M. Law and W. D. Kelton: "Simulation Modeling and Analysis", McGraw-Hill, 2000.
- R. Sargent: "Simulation model verification and validation". Winter Simulation Conference, 1991.
- L. Tesfation: "Notes on Learning", Technical Report, 2004.
- L. Tesfatsion: "Agent-based computational economics". ISU Technical Report, 2003.

Elective literature:

- Amman, H., Kendrick, D., Rust, J.: "Handbook of Computational Economics". Volume 1, Elsevier North-Holland, 1996.
- Tesfatsion, L., Judd, K.L.: "Handbook of Computational Economics". Volume 2: Agent-Based Computational Economics, Elsevier North-Holland, 2006.
- Marimon, R., Scott, A.: "Computational Methods for the Study of Dynamic Economies". Oxford University Press, 1999.
- Gilbert, N., Troitzsch, K.: "Simulation for the Social Scientist". Open University Press, 1999.

T 7.63 Course: Computational FinTech with Python and C++ [T-WIWI-106496]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103261 - Disruptive Finanz-technologische Innovationen
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2500003	Computational FinTech with Python and C++	1,5 SWS	Practical course (P)	Ulrich
SS 2019	2530373	Computational FinTech with Python and C++	1 SWS	Practical course (P)	Ulrich
Exams					
WS 18/19	7900289	Computational FinTech with Python and C++		Prüfung (PR)	Ulrich
SS 2019	7900123	Computational FinTech with Python and C++		Prüfung (PR)	Ulrich

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

Prerequisites
There are two conditions for taking this course:

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

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-106193 - Engineering FinTech Solutions must have been started.
2. The course T-WIWI-106495 - Automated Financial Advisory must have been started.

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

V Computational FinTech with Python and C++

2500003, WS 18/19, 1,5 SWS, Open in study portal — **Practical course (P)**

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

Workload
Roughly 45 hours.

V Computational FinTech with Python and C++

2530373, SS 2019, 1 SWS, Open in study portal — **Practical course (P)**

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

Workload
Roughly 45 hours.

T 7.64 Course: Computational Risk and Asset Management I [T-WIWI-107032]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103247 - Intelligente Risiko- und Investitionsberatung
M-WIWI-104900 - Betriebswirtschaftslehre

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

Competence Certificate
No exam in winter semester 2018/2019.

The grade consists of an exam and seven problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

Prerequisites
None.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102878 - Computational Risk and Asset Management must not have been started.

Recommendation
None

T 7.65 Course: Computational Risk and Asset Management II [T-WIWI-106494]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103247 - Intelligente Risiko- und Investitionsberatung
M-WIWI-104900 - Betriebswirtschaftslehre

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

Competence Certificate
No exam in winter term 2018/2019.

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and 6 problem sets, which are distributed throughout the semester. All problem sets count equally and make up in total 25% of the final grade. The exam accounts for the remaining 75%. The exam is based on all the material that is taught in the current semester. The exam takes place in the last week of the lecture period. Students who fail the exam are allowed to retake the exam.

Prerequisites
None.

Recommendation
It is recommend that students have studied the material of „Computational Risk and Asset Management I“.

Annotation
New course starting winter term 2017/2018.

T 7.66 Course: Computer Aided Data Analysis [T-GEISTSOZ-104565]

Responsible: Prof. Dr. Gerd Nollmann
Organisation: KIT Department of Humanities and Social Sciences
Part of: M-GEISTSOZ-101169 - Soziologie
M-WIWI-104906 - Geistes- und Sozialwissenschaften

Type	Credits	Version
Studienleistung	0	1

Events					
WS 18/19	5011009	Computergestütze Datenauswertung: Chatbots und Robo-Journalisten: Natural Language Processing mit Deep Learning	2 SWS	Course (Ku)	Nollmann
Exams					
WS 18/19	7400353	Computer Aided Data Analysis		Prüfung (PR)	Nollmann

T 7.67 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 7.68 Course: Constitution and Properties of Protective Coatings [T-MACH-105150]

Responsible: Prof. Dr. Sven Ulrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2177601	Constitution and Properties of Protective Coatings	2 SWS	Lecture (V)	Ulrich
Exams					
WS 18/19	76-T-MACH-105150	Constitution and Properties of Protective Coatings		Prüfung (PR)	Ulrich

Competence Certificate
oral examination (about 30 min)

no tools or reference materials

Prerequisites
none

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

V Constitution and Properties of Protective Coatings

2177601, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
introduction and overview

concepts of surface modification

coating concepts

coating materials

methods of surface modification

coating methods

characterization methods

state of the art of industrial coating of tools and components

new developments of coating technology

Workload
regular attendance: 22 hours
self-study: 98 hours

Literature
Bach, F.-W.: Modern Surface Technology, Wiley-VCH, Weinheim, 2006

Copies with figures and tables will be distributed

T 7.69 Course: Constitution and Properties of Wearresistant Materials [T-MACH-102141]

Responsible: Prof. Dr. Sven Ulrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2194643	Constitution and Properties of Wear resistant materials	2 SWS	Lecture (V)	Ulrich
Exams					
WS 18/19	76-T-MACH-102141	Constitution and Properties of Wearresistant Materials		Prüfung (PR)	Ulrich

Competence Certificate
oral examination (about 30 min)

no tools or reference materials

Prerequisites
none

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

V Constitution and Properties of Wear resistant materials

2194643, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
introduction

materials and wear

unalloyed and alloyed tool steels

high speed steels

stellites and hard alloys

hard materials

hard metals

ceramic tool materials

superhard materials

new developments

Workload
regular attendance: 22 hours
self-study: 98 hours

Literature

Laska, R. Felsch, C.: Werkstoffkunde für Ingenieure, Vieweg Verlag, Braunschweig, 1981

Schedler, W.: Hartmetall für den Praktiker, VDI-Verlage, Düsseldorf, 1988

Schneider, J.: Schneidkeramik, Verlag moderne Industrie, Landsberg am Lech, 1995

Copies with figures and tables will be distributed

T 7.70 Course: Construction Equipment [T-BGU-101845]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6243701	Maschinentechnik	2 SWS	Lecture (V)	Gentes, Dörfler
Exams					
WS 18/19	8240101845	Construction Equipment		Prüfung (PR)	Gentes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.71 Course: Control of Linear Multivariable Systems [T-ETIT-100666]

Responsible: Prof. Dr.-Ing. Sören Hohmann
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101157 - Regelungstechnik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each winter term	1

Events					
WS 18/19	2303177	Control of Linear Multivariable Systems	3 SWS	Lecture (V)	Kluwe
WS 18/19	2303179	Übungen zu 2303177 Regelung linearer Mehrgrößensysteme	1 SWS	Practice (Ü)	Köpf
Exams					
WS 18/19	7303177	Control of Linear Multivariable Systems		Prüfung (PR)	Kluwe

Prerequisites
none

T 7.72 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 7.73 Course: Convex Analysis [T-WIWI-102856]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Events					
SS 2019	2550120	Konvexe Analysis	SWS	Lecture (V)	Stein

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

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

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Prerequisites
None

Recommendation
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Annotation
The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

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

V Konvexe Analysis

2550120, SS 2019, SWS, Open in study portal **Lecture (V)**

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

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

Literature
Elective literature:

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

T 7.74 Course: Conveying Technology and Logistics [T-MACH-102135]

Responsible: Prof. Dr.-Ing. Kai Furmans
Paolo Pagani

Organisation: KIT Department of Mechanical Engineering

Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	2119100	Fördertechnik und Logistiksysteme	SWS	Seminar (S)	Furmans, Pagani
Exams					
WS 18/19	76-T-MACH-102135	Conveying Technology and Logistics		Prüfung (PR)	Furmans
SS 2019	76-T-MACH-102135	Conveying Technology and Logistics		Prüfung (PR)	Furmans

Competence Certificate
alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites
none

T 7.75 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 7.76 Course: Corporate Compliance [T-INFO-101288]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101242 - Governance, Risk & Compliance
M-WIWI-104903 - Recht

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2400087	Corporate Compliance	2 SWS	Lecture (V)	Herzig
Exams					
WS 18/19	7500063	Corporate Compliance		Prüfung (PR)	Dreier, Matz
SS 2019	7500063	Corporate Compliance		Prüfung (PR)	Dreier, Matz

T 7.77 Course: Corporate Financial Policy [T-WIWI-102622]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
M-WIWI-104900 - Betriebswirtschaftslehre

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

Exams				
WS 18/19	7900058	Corporate Financial Policy	Prüfung (PR)	Ruckes
SS 2019	7900073	Corporate Financial Policy	Prüfung (PR)	Ruckes

Competence Certificate
The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.

The exam is offered each semester.

Prerequisites
None

Annotation
The course will not be offered in summer term 2019. However, the exam can be written on the regular date at the end of the semester.

T 7.78 Course: Corporate Risk Management [T-WIWI-109050]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2530218	Corporate Risk Management	SWS	Lecture (V)	Ruckes, Hoang
SS 2019	2530219	Übung zu Corporate Risk Management	SWS	Practice (Ü)	Silbereis, Ruckes, Hoang
Exams					
WS 18/19	7900136	Corporate Risk Management		Prüfung (PR)	Ruckes

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

Prerequisites
None

Recommendation
None

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

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

V Corporate Risk Management

2530218, SS 2019, SWS, Open in study portal **Lecture (V)**

Learning Content

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

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

Literature

- Friberg, Richard. *Managing Risk and Uncertainity: A Strategic Approach.* Cambridge, MA: Managing RIsk and Uncertainity, 2015.
- Stulz, René M. *Risk Management & Derivatives*. Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed*: *The new Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006.

V Übung zu Corporate Risk Management

Practice (Ü)

2530219, SS 2019, SWS, Open in study portal

Learning Content

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

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

Literature

- Friberg, Richard. *Managing Risk and Uncertainity: A Strategic Approach.* Cambridge, MA: Managing RIsk and Uncertainity, 2015.
- Stulz, René M. *Risk Management & Derivatives*. Mason, Ohio: Cengage Learning, Inc, 2002.
- Jorion, Philippe. *Value at Risk, 3rd Ed*: *The new Benchmark for Managing Financial Risk*. 3 ed. New York: General Finance & Investing, 2006.

T 7.79 Course: Country Manager Simulation [T-WIWI-106137]

Responsible: Dr. Sven Feurer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-101490 - Marketing Management
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2572172	Country Manager Simulation	SWS	Block (B)	Feurer
Exams					
WS 18/19	7900154	Country Manager Simulation		Prüfung (PR)	Klarmann

Competence Certificate
Alternative exam assessment (30 minutes presentation) according to § 4 paragraph 2 Nr. 3 of the examination regulation SPO 2015.

Annotation
The course language is English. In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.
Please note that only one of the 1.5-ECTS courses can be chosen in this Module.
Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

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

V Country Manager Simulation

2572172, WS 18/19, SWS, Open in study portal **Block (B)**

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

Annotation

- The course language is English.
- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.
- Please note that only one of the following courses can be chosen in the Sales Management Module: Country Manager Simulation, Case Studies in Sales and Pricing or Preisverhandlungen und Verkaufspräsentationen.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

Workload
Total workload for 1.5 ECTS: ca. 45 hours

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

T 7.80 Course: Credit Risk [T-WIWI-102645]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2530565	Credit Risk	3 SWS	Lecture / Practice (VÜ)	Uhrig-Homburg, Hofmann
Exams					
WS 18/19	7900055	Credit Risk		Prüfung (PR)	Uhrig-Homburg

Competence Certificate
The assessment consists of a written exam (75 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation and may be supplemented by a non exam assessment according to § 4 paragraph 2 Nr. 3. The examination is offered every semester and can be repeated at every regular examination date.

Prerequisites
None

Recommendation
See German version.

Annotation
See German version.

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

V Credit Risk

2530565, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Description
The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed

Learning Content
The lecture deals with the diverse issues arising in the context of measuring and controlling credit risk. At first, the theoretical and empirical relations between ratings, probabilities of default, and credit spreads are analysed. After that, the focus is on the valuation of credit risk. Finally, the management of credit risk, e.g. using credit derivatives and credit portfolio analysis, is examined, and the legal framework and its implications are discussed

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

Literature

- Lando, D., Credit risk modeling: Theory and Applications, Princeton Univ. Press, (2004).
- Uhrig-Homburg, M., Fremdkapitalkosten, Bonitätsrisiken und optimale Kapitalstruktur, Beiträge zur betriebswirtschaftlichen Forschung 92, Gabler Verlag, (2001).

Elective literature:

- Bluhm, C., Overbeck, L., Wagner, C. , Introduction to Credit Risk Modelling, 2nd Edition, Chapman & Hall, CRC Financial Mathematics Series, (2010).
- Duffie, D., Singleton, K.J., Credit Risk: Pricing, Measurement and Management, Princeton Series of Finance, Prentice Hall, (2003).

T 7.81 Course: Critical Information Infrastructures [T-WIWI-109248]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	5	Each winter term	3

Events					
WS 18/19	2511400	Critical Information Infrastructures	2 SWS	Lecture (V)	Sunyaev
WS 18/19	2511401	Übungen zu Critical Information Infrastructures	1 SWS	Practice (Ü)	Sunyaev
Exams					
WS 18/19	7900067	Critical Information Infrastructures		Prüfung (PR)	Sunyaev
SS 2019	7900061	Critical Information Infrastructures		Prüfung (PR)	Sunyaev

Competence Certificate
The alternative exam assessment (§ 4(2), 3 SPO 2015) consists of

- the preparation of a written elaboration as well as
- an oral examination as part of a presentation of the work.

Details of the grades will be announced at the beginning of the course.

Prerequisites
None.

Annotation
New lecture from winter semester 2018/2019.

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

V Critical Information Infrastructures

2511400, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
The lecture critical information infrastructures introduces students to the world of these complex sociotechnical systems that permeate societies on a global scale. Students will learn to handle the complexities involved in the design, development, operation and evaluation of critical information infrastructures. In the beginning of the lecture, critical information infrastructures will be introduced on a general level. The following sessions will focus on an in-depth exploration of selected cases that represent current challenges in research and practice. For example, students will learn how to continuously monitor and audit critical information infrastructures to ensure reliability and security. Likewise, students will get to know how to deal with cascading failures in interconnected infrastructures.

T 7.82 Course: Current Issues in Innovation Management [T-WIWI-102873]

Responsible: Prof. Dr. Marion Weissenberger-Eibl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Irregular	1

Exams				
WS 18/19	7900041	Current Issues in Innovation Management	Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

Prerequisites
None

Recommendation
None

Annotation
Please note that the seminars we offer vary from semester to semester. Information about the currently offered seminars can be found in the Wiwi-Portal and on the iTM Website.

T 7.83 Course: Current Issues in the Insurance Industry [T-WIWI-102637]

Responsible: Wolf-Rüdiger Heilmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	2	Each summer term	1

Competence Certificate
The exam is offered latest in summer term 2016.
The assessment consists of a 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

Recommendation
For the understanding of this course knowledge of *Private and Social Insurance* [2530050] is required.

Annotation
Block course. For organizational reasons, please register with the secretay of the chair: thomas.mueller3@kit.edu.

T 7.84 Course: Current Topics on BioMEMS [T-MACH-102176]

Responsible: Prof. Dr. Andreas Guber
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101290 - BioMEMS
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	2

Events					
WS 18/19	2143873	Actual topics of BioMEMS	2 SWS	Seminar (S)	Guber
SS 2019	2143873	Actual topics of BioMEMS	2 SWS	Seminar (S)	Guber
Exams					
WS 18/19	76-T-MACH-102176	Current Topics on BioMEMS		Prüfung (PR)	Guber
SS 2019	76-T-MACH-102176	Current Topics on BioMEMS		Prüfung (PR)	Guber

Competence Certificate
active participation and own presentation (30 Min.)

Prerequisites
none

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

V Actual topics of BioMEMS

2143873, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Description
Media:
Written preparations from the participants.

Workload
Active participation on the seminary and preparation of an own presentation of a topic in BioMEMS.
Lecture time: 21 h
Preparation: 40 h
Preparation of own preparation: 60 h

V Actual topics of BioMEMS

2143873, SS 2019, 2 SWS, Open in study portal **Seminar (S)**

Description
Media:
Written preparations from the participants.

Workload
Active participation on the seminary and preparation of an own presentation of a topic in BioMEMS.
Lecture time: 21 h
Preparation: 40 h
Preparation of own preparation: 60 h

T 7.85 Course: Data Mining and Applications [T-WIWI-103066]

Responsible: Rheza Nakhaeizadeh
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101638 - Ökonometrie und Statistik I
M-WIWI-101639 - Ökonometrie und Statistik II
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 7.86 Course: Data Protection by Design [T-INFO-108405]

Responsible: PD Dr. Oliver Raabe
Organisation: KIT Department of Informatics
Part of: M-INFO-101242 - Governance, Risk & Compliance
M-WIWI-104903 - Recht
M-WIWI-104909 - Informatik (KIT-Fakultät für Informatik)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	2

Events					
WS 18/19	2400052	Data protection by design	2 SWS	Lecture (V)	Raabe
Exams					
WS 18/19	7500071	Data Protection by Design		Prüfung (PR)	Raabe
SS 2019	7500223	Data protection by design		Prüfung (PR)	Raabe

T 7.87 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 7.88 Course: Database Systems and XML [T-WIWI-102661]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511202	Database Systems and XML	2 SWS	Lecture (V)	Oberweis, Schiefer
WS 18/19	2511203	Übungen zu Datenbanksysteme und XML	1 SWS	Practice (Ü)	Oberweis, Schiefer, Fritsch
Exams					
WS 18/19	7900007	Database Systems and XML		Prüfung (PR)	Oberweis
SS 2019	7900046	Database Systems and XML		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites
None

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

V Database Systems and XML

2511202, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Databases are a proven technology for managing large amounts of data. The oldest database model, the hierarchical model, was replaced by different models such as the relational or the object-oriented data model. The hierarchical model became particularly more important with the emergence of the extensible Markup Language XML. XML is a data format for structured, semi-structured, and unstructured data. In order to store XML documents consistently and reliably, databases or extensions of existing data base systems are required. Among other things, this lecture covers the data model of XML, concepts of XML query languages, aspects of storage of XML documents, and XML-oriented database systems.

Workload
Lecture 30h
Exercise 15h

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

Total: 150h

Literature

- M. Klettke, H. Meyer: XML & Datenbanken: Konzepte, Sprachen und Systeme. dpunkt.verlag 2003
- H. Schöning: XML und Datenbanken: Konzepte und Systeme. Carl Hanser Verlag 2003
- W. Kazakos, A. Schmidt, P. Tomchyk: Datenbanken und XML. Springer-Verlag 2002
- R. Elmasri, S. B. Navathe: Grundlagen der Datenbanksysteme. 2009
- G. Vossen: Datenbankmodelle, Datenbanksprachen und Datenbankmanagementsysteme. Oldenbourg 2008

Further literature will be given individually.

T 7.89 Course: Derivatives [T-WIWI-102643]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101482 - Finance 1
M-WIWI-101483 - Finance 2
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 7.90 Course: Design Basics in Highway Engineering [T-BGU-106613]

Responsible: Prof. Dr.-Ing. Ralf Roos
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-100998 - Entwurf, Bau, Betrieb und Erhaltung von Straßen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6200408	Design Basics in Highway Engineering	2 SWS	Lecture (V)	Roos, Zimmermann
Exams					
WS 18/19	8230106613	Design Basics in Highway Engineering		Prüfung (PR)	Roos

Prerequisites
None

Recommendation
None

Annotation
None

T 7.91 Course: Design Thinking [T-WIWI-102866]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2545009	Design Thinking (Track 2)	2 SWS	Seminar (S)	Haller, Terzidis
SS 2019	2545008	Design Thinking (Track 1)	2 SWS	Seminar (S)	Terzidis, Jochem, Lau
Exams					
WS 18/19	7900025	Design Thinking (Track 2)		Prüfung (PR)	Terzidis

Competence Certificate
Alternative exam assessments (§4(2), 3 SPO).

Prerequisites
None

Recommendation
None

Annotation
The seminar content will be published on the website of the institute.

T 7.92 Course: Developing Business Models for the Semantic Web [T-WIWI-102851]

Responsible: Prof. Dr. Rudi Studer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	1

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
As a recommendation to attending the seminar, basic knowledge about semantic technologies and concepts should be available. This may be acquired by attending one of the following lectures – Wissensmanagement, Semantic Web Technologies 1, Semantic Web Technologies 2 or by studying related literature. Furthermore the topic entrepreneurship should be of interest.

T 7.93 Course: Digital Health [T-WIWI-109246]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	4	Each winter term	1

Events					
WS 18/19	2511402	Digital Health	2 SWS	Lecture (V)	Sunyaev, Kromat
Exams					
WS 18/19	7900068	Digital Health		Prüfung (PR)	Sunyaev
SS 2019	7900062	Digital Health		Prüfung (PR)	Sunyaev

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
New lecture from winter semester 2018/2019.

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

V Digital Health

2511402, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
The lecture "Digital Health" has a twofold purpose: first, to introduce theoretical foundations of various topics in digital health (they include, for instance, eHealth, health information systems, ambient assisted living, and smart homes in health care); and second, to introduce current topics in research on digital health (this includes for example genomics, gamification in health care, mobile health, and information privacy) by presenting papers and research projects the research group is working on. In addition, students are given the opportunity to combine the theoretical knowledge with real problems through a practical lecture.

Workload
4 ECTS = approx. 120 h.

T 7.94 Course: Digital Marketing and Sales in B2B [T-WIWI-106981]

Responsible: Anja Konhäuser
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2572176	Digital Marketing and Sales in B2B	1 SWS	Others (sonst.)	Konhäuser
Exams					
WS 18/19	7900169	Digital Marketing and Sales in B2B		Prüfung (PR)	Klarmann

Competence Certificate
Alternative exam assessment according to § 4 paragraph 2 Nr. 3 of the examination regulation. (team presentation of a case study with subsequent discussion totalling 30 minutes).

Prerequisites
None.

Annotation
Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the research group Marketing and Sales (marketing.iism.kit.edu).
Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed.
For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).
Please note that only one of the 1.5-ECTS courses can be attended in this module.

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

V Digital Marketing and Sales in B2B

2572176, WS 18/19, 1 SWS, Open in study portal **Others (sonst.)**

Learning Content
Learning Sessions:

The class gives insights into digital marketing strategies as well as the effects and potential of different channels (e.g., SEO, SEA, Social Media). After an overview of possible activities and leverages in the digital marketing field, including their advantages and limits, the focus will turn to the B2B markets. There are certain requirements in digital strategy specific to the B2B market, particularly in relation to the value chain, sales management and customer support. Therefore, certain digital channels are more relevant for B2B marketing than for B2C marketing.
Once the digital marketing and tactics for the B2B markets are defined, further insights will be given regarding core elements of a digital strategy: device relevance (mobile, tablet), usability concepts, website appearance, app decision, market research and content management. A major advantage of digital marketing is the possibility of being able to track many aspects of of user reactions and user behaviour. Therefore, an overview of key performance indicators (KPIs) will be discussed and relationships between these KPIs will be explained. To measure the effectiveness of digital activities, a digital report should be set up and connected to the performance numbers of the company (e.g. product sales) – within the course the setup of the KPI dashboard and combination of digital and non-digital measures will be shown to calculate the Return on Investment (RoI).

Presentation Sessions:

After the learning sessions, the students will form groups and work on digital strategies within a case study format. The presentation of the digital strategy will be in front of the class whereas the presentation will take 20 minutes followed by 10 minutes questions and answers.

Workload
time of presentness = 15 hrs.
private study = 30 hrs.

Literature
-

T 7.95 Course: Digital Service Design [T-WIWI-105773]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102806 - Service Innovation, Design & Engineering
M-WIWI-104080 - Designing Interactive Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540420	Digital Service Design	2 SWS	Lecture (V)	Mädche, Liu, Toreini
Exams					
WS 18/19	7900210	Digital Service Design		Prüfung (PR)	Mädche

Competence Certificate
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and the Digital Service Design challenge (40%). The exam and the Digital Service Design challenge need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the Digital Service Design challenge.

Prerequisites
None

Recommendation
None

Annotation
The course is held in English.

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

V Digital Service Design

2540420, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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

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

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

Learning Content

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

Literature

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

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

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

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

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

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

T 7.96 Course: Digital Transformation and Business Models [T-WIWI-108875]

Responsible: Dr. Daniel Jeffrey Koch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Exams				
SS 2019	7900284	Digital Transformation and Business Models	Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

The final grade is composed 75% of the grade of the written paper and 25% of the presentation.

Prerequisites
None

Recommendation
Prior attendance of the course Innovation Management [2545015] is recommended.

T 7.97 Course: Digital Transformation of Organizations [T-WIWI-106201]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101448 - Service Management
M-WIWI-102754 - Service Economics and Management
M-WIWI-102808 - Digital Service Systems in Industry
M-WIWI-104068 - Information Systems in Organizations
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540556	Digital Transformation and Organizations	3 SWS	Lecture (V)	Mädche
Exams					
WS 18/19	7900230	Digital Transformation of Organizations		Prüfung (PR)	Mädche

Competence Certificate
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (60%) and case study deliverable (40%). The exam and the case study need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the case study.

Prerequisites
None

Annotation
The course will be held in English.

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

V Digital Transformation and Organizations

2540556, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

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

Learning Content

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

Literature

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

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

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

T 7.98 Course: Digitalization of Products, Services & Production [T-MACH-108491]

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2122310	Digitalization of Products, Services & Production	2 SWS	Seminar (S)	Pätzold
SS 2019	2122310	Digitalization of Products, Services & Production	2 SWS	Seminar (S)	Pätzold
Exams					
WS 18/19	76-T-MACH-108491	Digitalization of Products, Services & Production		Prüfung (PR)	Pätzold

Competence Certificate
Assessment of another type. Two presentations in team work and two written compositions. Grading: each composition 1/6 and each presentation 2/3.

Prerequisites
none

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

V Digitalization of Products, Services & Production

2122310, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content

- Digitalization of products, services and production in the context of Industry 4.0 .
- Key drivers for ongoing digitalization and their impact on future product development and manufacturing.
- Methods and procedures to design the according transformation process.
- Intensive group discussions of use-case scenarios using practical examples from the industry.

V Digitalization of Products, Services & Production

2122310, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content

- Digitalization of products, services and production in the context of Industry 4.0 .
- Key drivers for ongoing digitalization and their impact on future product development and manufacturing.
- Methods and procedures to design the according transformation process.
- Intensive group discussions of use-case scenarios using practical examples from the industry.

T 7.99 Course: Disassembly Process Engineering [T-BGU-101850]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6243803	Verfahrenstechniken der Demontage	2 SWS	Lecture / Practice (VÜ)	Gentes
Exams					
WS 18/19	8240101850	Disassembly Process Engineering		Prüfung (PR)	Gentes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.100 Course: Discrete-Event Simulation in Production and Logistics [T-WIWI-102718]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102805 - Service Operations
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-104899 - Operations Research

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

Events					
SS 2019	2550488	Ereignisdiskrete Simulation in Produktion und Logistik	3 SWS	Lecture (V)	Spieckermann

Competence Certificate
The assessment consists of a written paper and an oral exam of about 30-40 min (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)).

Prerequisites
None

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

Annotation
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The course is planned to be held every summer term.

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

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

V Ereignisdiskrete Simulation in Produktion und Logistik

2550488, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Learning Content
Simulation of production and logistics systems is an interdisciplinary subject connecting expert knowledge from production management and operations research with mathematics/statistics as well as computer science and software engineering. With completion of this course, students know statistical foundations of discrete simulation, are able to classify and apply related software applications, and know the relation between simulation and optimization as well as a number of application examples. Furthermore, students are enabled to structure simulation studies and are aware of specific project scheduling issues.

Annotation
Basic knowledge as conveyed in the module "Introduction toOperations Research" is assumed.

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

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

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

Literature

- Banks J., Carson II J. S., Nelson B. L., Nicol D. M. (2010) Discrete-event system simulation, 5.Aufl., Pearson, Upper Saddle River.
- Eley, M. (2012): Simulation in der Logistik - Einführung in die Erstellung ereignisdiskreter Modelle unter Verwendung des Werkzeuges "Plant Simulation“, Springer, Berlin und Heidelberg
- Kosturiak, J. und M. Gregor (1995): Simulation von Produktionssystemen. Springer, Wien und New York.
- Law, A. M. (2015): Simulation Modeling and Analysis. 5th Edition, McGraw-Hill, New York usw.
- Liebl, F. (1995): Simulation. 2. Auflage, Oldenbourg, München.
- Noche, B. und S. Wenzel (1991): Marktspiegel Simulationstechnik. In: Produktion und Logistik. TÜV Rheinland, Köln.
- Pidd, M. (2004): Computer Simulation in Management Science. 5th Edition, Wiley, Chichester.
- Robinson S (2004) Simulation: the practice of model development and use. John Wiley & Sons, Chichester
- VDI (2014): Simulation von Logistik-, Materialfluß- und Produktionssystemen. VDI Richtlinie 3633, Blatt 1, VDI-Verlag, Düsseldorf.

T 7.101 Course: Dynamic Macroeconomics [T-WIWI-109194]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101478 - Innovation und Wachstum
M-WIWI-101496 - Wachstum und Agglomeration
M-WIWI-101497 - Agglomeration und Innovation
M-WIWI-104908 - Volkswirtschaftslehre

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

Events					
WS 18/19	2560402	Dynamic Macroeconomics	2 SWS	Lecture (V)	Brumm
WS 18/19	2560403	Übung zu Dynamic Macroeconomics	1 SWS	Practice (Ü)	Krause
Exams					
WS 18/19	7900261	Dynamic Macroeconomics		Prüfung (PR)	Scheffel

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

Prerequisites
None.

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

V Dynamic Macroeconomics

2560402, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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

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

Literature
Literature and lecture notes are provided during the course.

T 7.102 Course: Efficient Energy Systems and Electric Mobility [T-WIWI-102793]

Responsible: PD Dr. Patrick Jochem
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101452 - Energiewirtschaft und Technologie
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2581006	Efficient Energy Systems and Electric Mobility	2 SWS	Lecture (V)	Jochem, McKenna
Exams					
WS 18/19	7981006	Efficient Energy Systems and Electric Mobility		Prüfung (PR)	Fichtner

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

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

V Efficient Energy Systems and Electric Mobility

2581006, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
This lecture series combines two of the most central topics in the field of energy economics at present, namely energy efficiency and electric mobility. The objective of the lecture is to provide an introduction and overview to these two subject areas, including theoretical as well as practical aspects, such as the technologies, political framework conditions and broader implications of these for national and international energy systems.

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

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

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

Literature
Will be anounced in the lecture.

T 7.103 Course: eFinance: Information Systems for Securities Trading [T-WIWI-109941]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101446 - Market Engineering
M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-104900 - Betriebswirtschaftslehre

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 7.104 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-101263 - Einführung in die Logistik
M-MACH-101279 - 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 7.105 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-101263 - Einführung in die Logistik
M-MACH-101279 - 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

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 7.106 Course: Emerging Trends in Critical Information Infrastructures [T-WIWI-109250]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2513400	Emerging Trends in Critical Information Infrastructures	2 SWS	Seminar (S)	Lins, Sunyaev, Thiebes
Exams					
WS 18/19	7900114	Emerging Trends in Critical Information Infrastructures		Prüfung (PR)	Sunyaev
SS 2019	7900187	Emerging Trends in Critical Information Infrastructures		Prüfung (PR)	Sunyaev

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of a final thesis.

Prerequisites
None.

Annotation
The course is usually held as a block course.

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

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.

T 7.107 Course: Emissions into the Environment [T-WIWI-102634]

Responsible: Ute Karl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2581962	Emissions into the Environment	2 SWS	Lecture (V)	Karl
Exams					
WS 18/19	7981962	Emissions into the Environment		Prüfung (PR)	Schultmann

Competence Certificate
The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Recommendation
None

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

V Emissions into the Environment

2581962, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

A Air pollution control

- Indtroduction and definitions
- Sources an dpoluutants
- Regulatory framework
- Emission monitoring
- Air pollution control measures

B Waste management and Recycling

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

C Waste water treatment

- Municipal waste water treatment systems
- Sewage sludge disposal

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

Literature
Will be announced in thecourse.

T 7.108 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 7.109 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 7.110 Course: Energy and Environment [T-WIWI-102650]

Responsible: Ute Karl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101452 - Energiewirtschaft und Technologie
M-WIWI-101468 - Umwelt- und Ressourcenökonomie
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2581003	Energy and Environment	2 SWS	Lecture (V)	Karl
SS 2019	2581004	Übungen zu Energie und Umwelt	1 SWS	Practice (Ü)	Seddig, Keles
Exams					
WS 18/19	7981003	Energy and Environment		Prüfung (PR)	Fichtner

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

Prerequisites
None.

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

V Energy and Environment

2581003, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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

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

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

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

T 7.111 Course: Energy and Process Technology I [T-MACH-102211]

Responsible: Prof. Dr.-Ing. Hans-Jörg Bauer
Dr.-Ing. Corina Schwitzke
Dr. Amin Velji
Heiner Wirbser

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101296 - Energie- und Prozesstechnik I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each winter term	1

Events					
WS 18/19	2157961	Energy and Process Technology I	6 SWS	Lecture / Practice (VÜ)	Wirbser, Bauer, Mitarbeiter, Wagner, Schwitzke
Exams					
WS 18/19	76-T-MACH-102211	Energy and Process Technology I		Prüfung (PR)	Bauer, Wirbser, Schwitzke

Competence Certificate
The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
none

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

V Energy and Process Technology I

2157961, WS 18/19, 6 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content
The last thrid of the lecture deals with the topic **Thermal Turbomachinery**. The basic principles, the functionality and the scope of application of gas and steam tubrines for the generation of electrical power and propulsion technology are addressed.

T 7.112 Course: Energy and Process Technology II [T-MACH-102212]

Responsible: Dr.-Ing. Corina Schwitzke
Heiner Wirbser

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101297 - Energie- und Prozesstechnik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	9	Each summer term	1

Events					
SS 2019	2170832	Energy and Process Technology II	6 SWS	Lecture / Practice (VÜ)	Schwitzke, Wirbser
Exams					
WS 18/19	76-T-MACH-102212	Energy and Process Technology II		Prüfung (PR)	Schwitzke, Wirbser, Bauer

Competence Certificate
The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
none

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

V Energy and Process Technology II

2170832, SS 2019, 6 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content
Thermal Turbomaschinery - In the first part of the lecture deals with energy systems. Questions regarding global energy resources and their use, especially for the generation and provision of electrical energy, are addressed. Common fossile and nuclear power plants for the centralized supply with electrical power as well as concepts of power-heat cogeneration for the decentralized electrical power supply by means of block-unit heat and power plants, etc. are discussed. Moreover, the characteristics and the potential of renewable energy conversion concepts, such as wind and hydro-power, photovoltaics, solar heat, geothermal energy and fuel cells are compare and evaluated. The focus is on the description of the potentials, the risks and the economic feasibility of the different strategies aimed to protect resources and reduce CO2 emissions.

T 7.113 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 7.114 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-101263 - Einführung in die Logistik
M-MACH-101279 - 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 7.115 Course: Energy Market Engineering [T-WIWI-107501]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101411 - Information Engineering
M-WIWI-101446 - Market Engineering
M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-103720 - eEnergy: Markets, Services and Systems
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540464	Energy Market Engineering	2 SWS	Lecture (V)	Weinhardt, Staudt
SS 2019	2540465	Übung zu Energy Market Engineering	1 SWS	Practice (Ü)	Staudt, vom Scheidt

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

Recommendation
None

Annotation
Former course title until summer term 2017: T-WIWI-102794 "eEnergy: Markets, Services, Systems".

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

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

V Energy Market Engineering

2540464, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

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

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

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

Literature

- Erdmann G, Zweifel P. *Energieökonomik, Theorie und Anwendungen*. Berlin Heidelberg: Springer; 2007.
- Grimm V, Ockenfels A, Zoettl G. Strommarktdesign: Zur Ausgestaltung der Auktionsregeln an der EEX *. *Zeitschrift für Energiewirtschaft*. 2008:147-161.
- Stoft S. *Power System Economics: Designing Markets for Electricity*. IEEE; 2002.,
- Ströbele W, Pfaffenberger W, Heuterkes M. *Energiewirtschaft: Einführung in Theorie und Politik*. 2nd ed. München: Oldenbourg Verlag; 2010:349.

T 7.116 Course: Energy Networks and Regulation [T-WIWI-107503]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101446 - Market Engineering
M-WIWI-103720 - eEnergy: Markets, Services and Systems
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540494	Energy Networks and Regulation	2 SWS	Lecture (V)	Rogat
WS 18/19	2540495	Übung zu Energy Networks and Regulation	1 SWS	Practice (Ü)	Rogat
Exams					
WS 18/19	7900198	Energy Networks and Regulation		Prüfung (PR)	Weinhardt
WS 18/19	7900236	Energy Networks and Regulation		Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.
The exam is offered every semester. Re-examinations are offered on every ordinary examination date.

Prerequisites
None

Recommendation
None

Annotation
Former course title until summer term 2017: T-WIWI-103131 "Regulatory Management and Grid Management - Economic Efficiency of Network Operation"

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

V Energy Networks and Regulation

2540494, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The lecture “Energy Networks and Regulation” provides insights into the regulatory framework of electricity and gas. It touches upon the way the grids are operated and how regulation affects almost all grid activities. The lecture also addresses approaches of grid companies to cope with regulation on a managerial level. We analyze how the system influences managerial decisions and strategies such as investment or maintenance. Furthermore, we discuss how the system affects the operator’s abilities to deal with the massive challenges lying ahead (“Energiewende”, redispatch, European grid integration, electric vehicles etc.). Finally, we look at current developments and major upcoming challenges, e.g., the smart meter rollout. Covered topics include:

- Grid operation as a heterogeneous landscape: big vs. small, urban vs. rural, TSO vs. DSO.
- Objectives of regulation: Fair price calculation and high standard access conditions.
- The functioning of incentive regulation
- Amendment to the incentive regulation: its merits, its flaws
- The revenue cap and how it is adjusted according to certain exogenous factors
- Grid tariffs: How are they calculated, what is the underlying rationale, do we need a reform (and which)?
- Exogenous costs shifted (arbitrarily) into the grid, e.g. feed-in tariffs for renewable energy or decentralized supply.

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

Literature

Averch, H.; Johnson, L.L (1962). Behavior of the firm under regulatory constraint, in: American Economic Review, 52 (5), S. 1052 – 1069.

Bundesnetzagentur (2006): Bericht der Bundesnetzagentur nach § 112a EnWG zur Einführung der Anreizregulierung nach § 21a EnWG, http://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/Netzentgelte/Anreizregulierung/BerichtEinfuehrgAnreizregulierung.pdf?__blob=publicationFile&v=3.

Bundesnetzagentur (2015): Evaluierungsbericht nach § 33 Anreizregulierungsverordnung, https://www.bmwi.de/Redaktion/DE/Downloads/A/anreizregulierungsverordnung-evaluierungsbericht.pdf?__blob=publicationFile&v=1.

Filippini, M.; Wild, J.; Luchsinger, C. (2001) : Regulierung der Verteilnetzpreise zu Beginn der Marktöffnung. Erfahrungen in Norwegen und Schweden, Bundesamt für Energie, Bern, http://www.iaea.org/inis/collection/NCLCollectionStore/_Public/34/066/34066585.pdf.

Gómez, T. (2013): Monopoly Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 151 – 198, Springer-Verlag, London.

Gómez, T. (2013): Electricity Distribution, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 199 – 250, Springer-Verlag, London.

Pérez-Arriaga, I.J. (2013): Challenges in Power Sector Regulation, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 647 – 678, Springer-Verlag, London.

Rivier, M.; Pérez-Arriaga, I.J.; Olmos, L. (2013): Electricity Transmission, in: Pérez-Arriaga, I.J. (Hg.): Regulation of the Power Sector, S. 251 – 340, Springer-Verlag, London.

T 7.117 Course: Energy Systems Analysis [T-WIWI-102830]

Responsible: Dr. Armin Ardone
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101452 - Energiewirtschaft und Technologie
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2581002	Energy Systems Analysis	2 SWS	Lecture (V)	Ardone
Exams					
WS 18/19	7981002	Energy Systems Analysis		Prüfung (PR)	Fichtner

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

Prerequisites
None

Recommendation
None

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

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

V Energy Systems Analysis

2581002, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
1. Overview and classification of energy systems modelling approaches
2. Usage of scenario techniques for energy systems analysis
3. Unit commitment of power plants
4. Interdependencies in energy economics
5. Scenario-based decision making in the energy sector
6. Visualisation and GIS techniques for decision support in the energy sector

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

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

T 7.118 Course: Energy Trade and Risk Management [T-WIWI-102691]

Responsible: Dr. Clemens Cremer
Prof. Dr. Wolf Fichtner
Dr. Dogan Keles

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	1

Events					
SS 2019	2581020	Energy Trade and Risk Management	3 SWS	Lecture (V)	Keles, Cremer
Exams					
WS 18/19	7981020	Energy Trade and Risk Management		Prüfung (PR)	Fichtner

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

Prerequisites
None

Recommendation
None

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

V Energy Trade and Risk Management

2581020, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Learning Content

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

Annotation
The credits have been changed from 3.5 to 4.

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

Literature
Elective literature:

Burger, M., Graeber, B., Schindlmayr, G. (2007): *Managing energy risk: An integrated view on power and other energy markets*, Wiley&Sons, Chichester, England

EEX (2010): *Einführung in den Börsenhandel an der EEX auf Xetra und Eurex*, www.eex.de

Erdmann, G., Zweifel, P. (2008), Energieökonomik, Theorie und Anwendungen, Springer, ISBN: 978-3-540-71698-3

Hull, J.C. (2006): *Options, Futures and other Derivatives*, 6. Edition, Pearson Prentice Hall, New Jersey, USA

Borchert, J., Schlemm, R., Korth, S. (2006): *Stromhandel: Institutionen, Marktmodelle, Pricing und Risikomanagement (Gebundene Ausgabe)*, Schäffer-Poeschel Verlag

www.riskglossary.com

T 7.119 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 7.120 Course: Engineering FinTech Solutions [T-WIWI-106193]

Responsible: Prof. Dr Maxim Ulrich
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103247 - Intelligente Risiko- und Investitionsberatung
M-WIWI-103261 - Disruptive Finanz-technologische Innovationen
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2530357	Engineering FinTech Solutions	2 SWS	Lecture (V)	Ulrich
SS 2019	2530357	Engineering FinTech Solutions	3 SWS	Lecture (V)	Ulrich
Exams					
WS 18/19	7900287	Engineering FinTech Solutions		Prüfung (PR)	Ulrich
SS 2019	7900125	Engineering FinTech Solutions		Prüfung (PR)	Ulrich

Competence Certificate
Alternative exam assessment (§ 4(2), 3 SPO 2015). Details of the grade formation will be announced at the beginning of the course.

Prerequisites
This course is only open for registered students of the module “Intelligent Risk and Investment Advisory” and “Disruptive FinTech Solutions”.

Recommendation
None

Annotation
The course will be held in English language.

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

V Engineering FinTech Solutions
2530357, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
This project-oriented lecture invites students to work independently and yet, under close monitoring of researchers and the professor of the C-RAM research group, on a sub-problem of a larger FinTech research question. Students will in a personalized manner be introduced to the necessary concepts, tools and methods that are necessary to solve the question at hand. Students obtain the opportunity to connect newest research insights with modern information technology to move a step closer towards their own development of a prototype. Depending on the topic, students work alone or in groups. An essential part of the guided research mentoring is that students take part in weekly meetings to discuss open issues, to present their progress and to learn from their fellow students

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

Literature
Literature will be distributed during the first lecture.

V Engineering FinTech Solutions
2530357, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Notes
New course starting summer term 2019.

Learning Content
This project-oriented lecture invites students to work independently and yet, under close monitoring of researchers and the professor of the C-RAM research group, on a sub-problem of a larger FinTech research question. Students will in a personalized manner be introduced to the necessary concepts, tools and methods that are necessary to solve the question at hand. Students obtain the opportunity to connect newest research insights with modern information technology to move a step closer towards their own development of a prototype. Depending on the topic, students work alone or in groups. An essential part of the guided research mentoring is that students take part in weekly meetings to discuss open issues, to present their progress and to learn from their fellow students

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

Literature
Literature will be distributed during the first lecture.

T 7.121 Course: Engineering Hydrology [T-BGU-108943]

Responsible: Dr.-Ing. Uwe Ehret
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	6200617	Ingenieurhydrologie	2 SWS	Lecture / Practice (VÜ)	Ehret

Competence Certificate
See German version.

Prerequisites
None

T 7.122 Course: Enterprise Architecture Management [T-WIWI-102668]

Responsible: Thomas Wolf
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511600	Enterprise Architecture Management	2 SWS	Lecture (V)	Wolf
WS 18/19	2511601	Übungen zu Enterprise Architecture Management	1 SWS	Practice (Ü)	Wolf
Exams					
WS 18/19	7900010	Enterprise Architecture Management		Prüfung (PR)	Oberweis
SS 2019	7900043	Enterprise Architecture Management		Prüfung (PR)	Wolf

Competence Certificate
The assessment of this course is a written (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

Prerequisites
None

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

V Enterprise Architecture Management

2511600, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The following topics will be covered: components of enterprise architecture, enterprise strategy including methods to develop strategies, business process (re)engineering, methods to implement changes within enterprises (management of change)

Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995
- Doppler, K., Lauterburg, Ch.: Change Management. Campus Verlag 1997
- Jacobson, I.: The Object Advantage, Business Process Reengineering with Object Technology. Addison-Wesley Publishing Company, Wokingham England 1994
- Keller, G., Teufel, Th.: SAP R/3 prozessorientiert anwenden. Addison Wesley 1998
- Österle, H.: Business Engineering Bd. 1 und 2. Springer Verlag, Berlin 1995

T 7.123 Course: Entrepreneurial Leadership & Innovation Management [T-WIWI-102833]

Responsible: Dr. Carsten Linz
Prof. Dr. Orestis Terzidis

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	2

Competence Certificate
Please note: The seminar cannot be offered in the winter semester 2018/2019 due to organizational reasons.

Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
None

T 7.124 Course: Entrepreneurship [T-WIWI-102864]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
SS 2019	2545001	Entrepreneurship	2 SWS	Lecture (V)	Terzidis, Mitarbeiter
Exams					
WS 18/19	7900045	Entrepreneurship		Prüfung (PR)	Terzidis
WS 18/19	7900215	Entrepreneurship		Prüfung (PR)	Terzidis
WS 18/19	7900229	Entrepreneurship		Prüfung (PR)	Terzidis

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

Prerequisites
None

Recommendation
None

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

V Entrepreneurship

2545001, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
This lecture, as an obligatory part of the module “Entrepreneurship”, introduces basic concepts of entrepreneurship. It approaches the individual steps of dynamic corporate development. The focus here is the introduction to methods for generating innovative business ideas, the translation of patents into business concepts and general principles of business planning.
Other topics are the design and use of service-oriented information systems for founders, technology management, business model generation and lean startup methods for the implementation of business ideas in the way of controlled experiments in the market.

Learning Content
This lecture, as an obligatory part of the module "Entrepreneurship", introduces basic concepts of entrepreneurship. It approaches the individual steps of dynamic corporate development. The focus here is the introduction to methods for generating innovative business ideas, the translation of patents into business concepts and general principles of financial planning.
Other topics are the design and use of service-oriented information systems for founders, technology management, business model generation and lean startup methods for the implementation of business ideas in the way of controlled experiments in the market.

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

T 7.125 Course: Entrepreneurship Research [T-WIWI-102894]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	2545002	Entrepreneurship Research	2 SWS	Seminar (S)	Avila Albez, Terzidis, Tittel

Competence Certificate
The performance review is done via a so called other methods of performance review (term paper) (non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015)). The final grade is a result from both, the grade of the term paper and its presentation, as well as active participation during the seminar.

Prerequisites
None

Recommendation
None

Annotation
The topics will be prepared in groups. The presentation of the results is done during a a block period seminar at the end of the semester. Students have to be present all day long during the seminar.

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

V Entrepreneurship Research

2545002, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

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

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

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

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

T 7.126 Course: Environmental and Resource Policy [T-WIWI-102616]

Responsible: Rainer Walz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101468 - Umwelt- und Ressourcenökonomie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	1

Exams				
WS 18/19	7900271	Environmental and Resource Policy	Prüfung (PR)	Mitusch

Competence Certificate
See German version

Recommendation
It is recommended to already have knowledge in the area of industrial organization and economic policy. This knowledge may be acquired in the courses*Introduction to Industrial Organization* [2520371] and*Economic Policy*[2560280].

T 7.127 Course: Environmental Communication [T-BGU-101676]

Responsible: Dr. Charlotte Kämpf
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	2

Events					
WS 18/19	6224905	Umweltkommunikation / Environmental Communication	2 SWS	Seminar (S)	Kämpf
SS 2019	6224905	Environmental Communication	2 SWS	Seminar (S)	Kämpf
Exams					
WS 18/19	8244101676	Environmental Communication		Prüfung (PR)	Kämpf

Competence Certificate
Non exam assessment (following §4(2), 3 of the examination regulation).

Prerequisites
Examination Prerequisite Environmental Communication must be passend.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-BGU-106620 - Examination Prerequisite Environmental Communication must have been passed.

Recommendation
None

Annotation
none

T 7.128 Course: Environmental Economics and Sustainability [T-WIWI-102615]

Responsible: Rainer Walz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101468 - Umwelt- und Ressourcenökonomie
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2521547	Umweltökonomik und Nachhaltigkeit (mit Übung)	2 SWS	Lecture / Practice (VÜ)	Walz
Exams					
WS 18/19	7900273	Environmental Economics and Sustainability	Prüfung (PR)		Mitusch

Competence Certificate
See German version

Prerequisites
None

Recommendation
It is recommended to already have knowledge in the area of macro- and microeconomics. This knowledge may be acquired in the courses *Economics I: Microeconomics* [2600012] and *Economics II: Macroeconomics* [2600014].

T 7.129 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-101468 - Umwelt- und Ressourcenökonomie
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 7.130 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 7.131 Course: Examination Prerequisite Environmental Communication [T-BGU-106620]

Responsible: Dr. Charlotte Kämpf
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement

Type	Credits	Recurrence	Version
Studienleistung	0	Each summer term	1

Events					
WS 18/19	6224905	Umweltkommunikation / Environmental Communication	2 SWS	Seminar (S)	Kämpf
SS 2019	6224905	Environmental Communication	2 SWS	Seminar (S)	Kämpf
Exams					
WS 18/19	8244106620	Examination Prerequisite Environmental Communication		Prüfung (PR)	Kämpf

Competence Certificate
2 literature annotations, appr. 150 words each, and
short presentation, appr. 10 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.132 Course: Exchanges [T-WIWI-102625]

Responsible: Dr. Jörg Franke
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
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 7.133 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	1

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

T 7.134 Course: Experimental Economics [T-WIWI-102614]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101446 - Market Engineering
M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101505 - Experimentelle Wirtschaftsforschung
M-WIWI-103118 - Data Science: Data-Driven User Modeling
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540489	Experimental Economics	2 SWS	Lecture (V)	Pfeiffer, Peukert, Dorner, Knierim
WS 18/19	2540493	Übung zu Experimentelle Wirtschaftsforschung	1 SWS	Practice (Ü)	Knierim
Exams					
WS 18/19	7900178	Experimental Economics		Prüfung (PR)	Weinhardt
WS 18/19	7900194	Experimental Economics		Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

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

V Experimental Economics

2540489, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

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

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

Literature

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.
- Handbook of Experimental Economics; J. Kagel, A. Roth; Princeton University Press, 1995.
- Experiments in Economics; J.D. Hey; Blackwell Publishers, 1991.
- Experimental Economics; D.D. Davis, C.A. Holt; Princeton University Press, 1993.
- Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.

T 7.135 Course: Experimental Lab Class in Welding Technology, in Groups [T-MACH-102099]

Responsible: Dr.-Ing. Stefan Dietrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	4	Each winter term	2

Events					
WS 18/19	2173560	Welding Lab Course, in groupes	3 SWS	Practical course (P)	Dietrich, Schulze
Exams					
WS 18/19	76-T-MACH-102099	Experimental Lab Class in Welding Technology, in Groups		Prüfung (PR)	Heilmaier, Dietrich

Competence Certificate
Certificate to be issued after evaluation of the lab class report.

Prerequisites
Certtificate of attendance for Welding technique (The participation in the course Welding Technology I/II is assumed.).

Annotation
The lab takes place at the beginning of the winter semester break once a year. The registration is possible during the lecture period in the secretariat of the Institute of Applied Materials (IAM – WK). The lab is carried out in the Handwerkskammer Karlsruhe.

You need sturdy shoes and long clothes!

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

V Welding Lab Course, in groupes

2173560, WS 18/19, 3 SWS, Open in study portal — **Practical course (P)**

Notes
The lab takes place at the beginning of the winter semester break once a year. The registration is possible during the lecture period in the secretariat of the Institute of Applied Materials (IAM – WK). The lab is carried out in the Handwerkskammer Karlsruhe.

You need sturdy shoes and long clothes!

Learning Content
Gas welding of steels with different weld geometries

Gas welding of cast iron, nonferrous metals

Brazing of aluminum

Electric arc welding with different weld geometries

Gas welding according to the TIG, MIG and MAG procedures

Annotation
The lab takes place at the beginning of the winter semester break once a year. The registration is possible during the lecture period in the secretariat of the Institute of Applied Materials (IAM – WK). The lab is carried out in the Handwerkskammer Karlsruhe.

You need sturdy shoes and long clothes!

Workload
regular attendance: 31,5 hours
preparation: 8,5 hours
lab report: 80 hours

Literature
distributed during the lab attendance

T 7.136 Course: Extraordinary additional course in the module Cross-Functional Management Accounting [T-WIWI-108651]

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101510 - Cross-Functional Management Accounting

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

Competence Certificate
The assessment depends on which extraordinary course becomes part of the module "Cross-Functional Management Accounting".

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Prerequisites
None

Annotation
The pupose of this placeholder is to make it possible zu include an extraordinary course in the module "Cross-Functional Management Accounting". Proposals for specific courses have to be approved in advance by the module coordinator.

T 7.137 Course: Fabrication Processes in Microsystem Technology [T-MACH-102166]

Responsible: Dr. Klaus Bade
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each term	1

Events					
WS 18/19	2143882	Fabrication Processes in Microsystem Technology	2 SWS	Lecture (V)	Bade
SS 2019	2143882	Fabrication Processes in Microsystem Technology	2 SWS	Lecture (V)	Bade
Exams					
WS 18/19	76-T-MACH-102166	Fabrication Processes in Microsystem Technology		Prüfung (PR)	Bade
SS 2019	76-T-MACH-102166	Fabrication Processes in Microsystem Technology		Prüfung (PR)	Bade

Competence Certificate
Oral examination, 20 minutes

Prerequisites
none

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

V Fabrication Processes in Microsystem Technology

2143882, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:

pdf files of presentation sheets

Learning Content
The lecture offers an advanced understanding of manufacturing processes in microsystem technology. Basic aspects of microtechnological processing will be introduced. With examples from semiconductor microfabrication and microsystem technology the base processing steps for conditioning and finishing, patterning, removal are imparted. Nano-patterning is covered is also included and the micro-nano interface is discussed. By the help of typical processing steps elementary mechanisms, process execution, and equipment are explained. Additionally quality control, process control and environmental topics are included

Literature
M. Madou
Fundamentals of Microfabrication
CRC Press, Boca Raton, 1997
W. Menz, J. Mohr, O. Paul
Mikrosystemtechnik für Ingenieure
Dritte Auflage, Wiley-VCH, Weinheim 2005
L.F. Thompson, C.G. Willson, A.J. Bowden
Introduction to Microlithography
2nd Edition, ACS, Washington DC, 1994

V Fabrication Processes in Microsystem Technology

2143882, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Description
Media:
pdf files of presentation sheets

Learning Content
The lecture offers an advanced understanding of manufacturing processes in microsystem technology. Basic aspects of microtechnological processing will be introduced. With examples from semiconductor microfabrication and microsystem technology the base processing steps for conditioning and finishing, patterning, removal are imparted. Nano-patterning is covered is also included and the micro-nano interface is discussed. By the help of typical processing steps elementary mechanisms, process execution, and equipment are explained. Additionally quality control, process control and environmental topics are included

Literature
M. Madou
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Mikrosystemtechnik für Ingenieure
Dritte Auflage, Wiley-VCH, Weinheim 2005
L.F. Thompson, C.G. Willson, A.J. Bowden
Introduction to Microlithography
2nd Edition, ACS, Washington DC, 1994

T 7.138 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-102832 - Operations Research im 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 7.139 Course: Failure of Structural Materials: Deformation and Fracture [T-MACH-102140]

Responsible: Prof. Dr. Peter Gumbsch
Dr. Daniel Weygand

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2181711	Failure of structural materials: deformation and fracture	3 SWS	Lecture / Practice (VÜ)	Gumbsch, Weygand
Exams					
WS 18/19	76-T-MACH-102140	Failure of Structural Materials: Deformation and Fracture		Prüfung (PR)	Weygand, Gumbsch, Kraft

Competence Certificate
oral exam ca. 30 minutes

no tools or reference materials

Prerequisites
none

Recommendation
preliminary knowlegde in mathematics, mechanics and materials science

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

V Failure of structural materials: deformation and fracture

2181711, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content

1. Introduction
2. linear elasticity
3. classification of stresses
4. Failure due to plasticity
   - tensile test
   - dislocations
   - hardening mechanisms
   - guidelines for dimensioning
5. composite materials
6. fracture mechanics
   - hypotheses for failure
   - linear elasic fracture mechanics
   - crack resitance
   - experimental measurement of fracture toughness
   - defect measurement
   - crack propagation
   - application of fracture mechanics
   - atomistics of fracture

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); worth reading, relatively simple but comprehensive
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); classic on the mechanical behavior of materials, extensive and good
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relatively simple but yet comprehensive overview of metallic materials

T 7.140 Course: Failure of Structural Materials: Fatigue and Creep [T-MACH-102139]

Responsible: Dr. Patric Gruber
Prof. Dr. Peter Gumbsch

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2181715	Failure of Structural Materials: Fatigue and Creep	2 SWS	Lecture (V)	Gruber, Gumbsch
Exams					
WS 18/19	76-T-MACH-102139	Failure of Structural Materials: Fatigue and Creep		Prüfung (PR)	Kraft, Gumbsch, Gruber

Competence Certificate
oral exam ca. 30 minutes

no tools or reference materials

Prerequisites
none

Recommendation
preliminary knowlegde in mathematics, mechanics and materials science

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

V Failure of Structural Materials: Fatigue and Creep

2181715, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1 Fatigue
1.1 Introduction
1.2 Statistical Aspects
1.3 Lifetime
1.4 Fatigue Mechanisms
1.5 Material Selection
1.6 Thermomechanical Loading
1.7 Notches and Shape Optimization
1.8 Case Study: ICE-Desaster

2 Creep
2.1 Introduction
2.2 High Temperature Plasticity
2.3 Phänomenological DEsciption of Creep
2.4 Creep Mechanisms
2.5 Alloying Effects

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); worth reading, relatively simple but comprehensive
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); classic on the mechanical behavior of materials, extensive and good
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relatively simple but yet comprehensive overview of metallic materials
- Fatigue of Materials, Subra Suresh (2nd Edition, Cambridge University Press); standard work on fatigue, all classes of materials, extensive, for beginners and advanced student

T 7.141 Course: Financial Analysis [T-WIWI-102900]

Responsible: Dr. Torsten Luedecke
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2530205	Financial Analysis	2 SWS	Lecture (V)	Luedecke
SS 2019	2530206	Übungen zu Financial Analysis	2 SWS	Practice (Ü)	Luedecke
Exams					
WS 18/19	7900059	Financial Analysis		Prüfung (PR)	Luedecke, Ruckes
SS 2019	7900075	Financial Analysis		Prüfung (PR)	Luedecke

Competence Certificate
See German version.

Prerequisites
None

Recommendation
Basic knowledge in corporate finance, accounting, and valuation is required.

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

V Financial Analysis

2530205, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

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

Learning Content
Topics:

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

Literature

- Alexander, D. and C. Nobes (2017): Financial Accounting – An International Introduction, 6th ed., Pearson.
- Penman, S.H. (2013): Financial Statement Analysis and Security Valuation, 5th ed., McGraw Hill.

T 7.142 Course: Financial Econometrics [T-WIWI-103064]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101638 - Ökonometrie und Statistik I
M-WIWI-101639 - Ökonometrie und Statistik II
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 7.143 Course: Financial Intermediation [T-WIWI-102623]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-101502 - Ökonomische Theorie und ihre Anwendung in Finance
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 7.144 Course: Fixed Income Securities [T-WIWI-102644]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
M-WIWI-104900 - Betriebswirtschaftslehre

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

Exams				
WS 18/19	7900053	Fixed Income Securities	Prüfung (PR)	Uhrig-Homburg

Competence Certificate
Please note that the lecture is not held in winter semester 18/19.

The assessment consists of a written exam (75 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation SPO2015 and may be supplemented by a non exam assessment according to § 4 paragraph 2 Nr. 3.The examination is offered every semester and can be repeated at every regular examination date.

Prerequisites
None

Recommendation
Knowledge from the course "Derivatives" is very helpful.

Annotation
See German version.

T 7.145 Course: Fluid Power Systems [T-MACH-102093]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Felix Pult

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-MACH-101267 - Mobile Arbeitsmaschinen

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	2

Events					
WS 18/19	2114093	Fluid Technology	2 SWS	Lecture (V)	Geimer, Pult
Exams					
WS 18/19	76T-MACH-102093	Fluid Power Systems		Prüfung (PR)	Geimer
SS 2019	76-T-MACH-102093	Fluid Power Systems		Prüfung (PR)	Geimer

Competence Certificate
The assessment consists of a writen exam (90 minutes) taking place in the recess period. 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 Fluid Technology

2114093, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
In the range of hydrostatics the following topics will be introduced:

- Hydraulic fluids
- Pumps and motors
- Valves
- Accessories
- Hydraulic circuits.

In the range of pneumatics the following topics will be introduced:

- Compressors
- Motors
- Valves
- Pneumatic circuits.

Workload

- regular attendance: 21 hours
- self-study: 92 hours

Literature
Scritum for the lecture *Fluidtechnik*
Institute of Vehicle System Technology
downloadable

T 7.146 Course: Foundations of Information Systems [T-WIWI-109918]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101411 - Information Engineering
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	2540450	Foundations of Information Systems	2 SWS	Lecture (V)	Weinhardt, Mädche
WS 18/19	2540451	Übungen zu "Foundations of Information Systems"	1 SWS	Practice (Ü)	Jung, Mädche, Weinhardt

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

Prerequisites
None

Recommendation
None

Annotation
This course replaces T-WIWI-102638 "Principles of Information Engineering and Management" as of summer semester 2019.

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

V Foundations of Information Systems

2540450, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

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

- extraction/generation,
- storage,
- transformation,
- evaluation,
- marketing
- and usage of information

are analyzed from the business administration perspective and the microeconomic perspective. The state of the art of economic theory is presented across this information lifecycle within the lectures. The content of the lecture is deepened in accompanying lecture courses.

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

Literature

- Shapiro, C., Varian, H., Information Rules: A Strategic Guide to the Network Economy. Harvard Business School Press 1999.
- Stahlknecht, P., Hasenkamp, U., Einführung in die Wirtschaftsinformatik. Springer Verlag 7. Auflage, 1999.
- Wirth, H., Electronic Business. Gabler Verlag 2001.

T 7.147 Course: Foundry Technology [T-MACH-105157]

Responsible: Dr.-Ing. Christian Wilhelm
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2174575	Foundry Technology	2 SWS	Lecture (V)	Wilhelm

Competence Certificate
oral exam; about 25 minutes

Prerequisites
None

Recommendation
It is strongly recommended to pass the two courses "Materials Science I" (T-MACH-102078) and "Materials Science II" (T-MACH-102079).

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

V Foundry Technology

2174575, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Moulding and casting processes
Solidifying of melts
Castability
Fe-Alloys
Non-Fe-Alloys
Moulding and additive materials
Core production
Sand reclamation
Design in casting technology
Casting simulation
Foundry Processes

Workload
The workload for the lecture Foundry Technology is 120 h per semester and consists of the presence during the lecture (21 h) as well as preparation and rework time at home (99 h).

Literature
Reference to literature, documentation and partial lecture notes given in lecture

T 7.148 Course: Freight Transport [T-BGU-106611]

Responsible: Bastian Chlond
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	2

Events					
SS 2019	6232809	Güterverkehr	2 SWS	Lecture / Practice (VÜ)	Chlond
Exams					
WS 18/19	8245106611	Freight Transport		Prüfung (PR)	Chlond

Competence Certificate
written exam, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.149 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 7.150 Course: Fundamentals for Design of Motor-Vehicle Bodies I [T-MACH-102116]

Responsible: Horst Dietmar Bardehle
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	2113814	Fundamentals for Design of Motor-Vehicles Bodies I	1 SWS	Lecture (V)	Bardehle
Exams					
WS 18/19	76-T-MACH-102116	Fundamentals for Design of Motor-Vehicle Bodies I		Prüfung (PR)	Unrau, Bardehle
SS 2019	76-T-MACH-102116	Fundamentals for Design of Motor-Vehicle Bodies I		Prüfung (PR)	Bardehle, Unrau

Competence Certificate
Oral group examination

Duration: 30 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals for Design of Motor-Vehicles Bodies I

2113814, WS 18/19, 1 SWS, Open in study portal **Lecture (V)**

Learning Content
1. History and design

2. Aerodynamics

3. Design methods (CAD/CAM, FEM)

4. Manufacturing methods of body parts

5. Fastening technologie

6. Body in white / body production, body surface

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

T 7.151 Course: Fundamentals for Design of Motor-Vehicle Bodies II [T-MACH-102119]

Responsible: Horst Dietmar Bardehle
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
SS 2019	2114840	Fundamentals for Design of Motor-Vehicles Bodies II	1 SWS	Lecture (V)	Bardehle
Exams					
WS 18/19	76-T-MACH-102119	Fundamentals for Design of Motor-Vehicle Bodies II		Prüfung (PR)	Bardehle
SS 2019	76-T-MACH-102119	Fundamentals for Design of Motor-Vehicle Bodies II		Prüfung (PR)	Bardehle, Gauterin

Competence Certificate
Oral group examination

Duration: 30 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals for Design of Motor-Vehicles Bodies II

2114840, SS 2019, 1 SWS, Open in study portal **Lecture (V)**

Notes
Scheduled dates:
see homepage of the institute.
Further information and possible changes of date: see homepage of the institute.

Learning Content
1. Body properties/testing procedures

2. External body-parts

3. Interior trim

4. Compartment air conditioning

5. Electric and electronic features

6. Crash tests

7. Project management aspects, future prospects

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature
1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

T 7.152 Course: Fundamentals in the Development of Commercial Vehicles I [T-MACH-105160]

Responsible: Prof. Dr. Jörg Zürn
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-MACH-101267 - Mobile Arbeitsmaschinen
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	2113812	Fundamentals in the Development of Commercial Vehicles I	1 SWS	Lecture (V)	Zürn
Exams					
WS 18/19	76-T-MACH-105160	Fundamentals in the Development of Commercial Vehicles I		Prüfung (PR)	Zürn
SS 2019	76-T-MACH-105160	Fundamentals in the Development of Commercial Vehicles I		Prüfung (PR)	Zürn

Competence Certificate
Oral group examination

Duration: 30 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals in the Development of Commercial Vehicles I

2113812, WS 18/19, 1 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Introduction, definitions, history
2. Development tools
3. Complete vehicle
4. Cab, bodyshell work
5. Cab, interior fitting
6. Alternative drive systems
7. Drive train
8. Drive system diesel engine
9. Intercooled diesel engines

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

1. Marwitz, H., Zittel, S.: ACTROS -- die neue schwere Lastwagenbaureihe von Mercedes-Benz, ATZ 98, 1996, Nr. 9

2. Alber, P., McKellip, S.: ACTROS -- Optimierte passive Sicherheit, ATZ 98, 1996

3. Morschheuser, K.: Airbag im Rahmenfahrzeug, ATZ 97, 1995, S. 450 ff.

T 7.153 Course: Fundamentals in the Development of Commercial Vehicles II [T-MACH-105161]

Responsible: Prof. Dr. Jörg Zürn
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-MACH-101267 - Mobile Arbeitsmaschinen
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
SS 2019	2114844	Fundamentals in the Development of Commercial Vehicles II	1 SWS	Lecture (V)	Zürn
Exams					
WS 18/19	76-T-MACH-105161	Fundamentals in the Development of Commercial Vehicles II		Prüfung (PR)	Zürn
SS 2019	76-T-MACH-105161	Fundamentals in the Development of Commercial Vehicles II		Prüfung (PR)	Zürn

Competence Certificate
Oral group examination

Duration: 30 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals in the Development of Commercial Vehicles II

2114844, SS 2019, 1 SWS, Open in study portal — **Lecture (V)**

Learning Content
1. Gear boxes of commercial vehicles
2. Intermediate elements of the drive train
3. Axle systems
4. Front axles and driving dynamics
5. Chassis and axle suspension
6. Braking System
7. Systems
8. Excursion

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

1. Schittler, M., Heinrich, R., Kerschbaum, W.: Mercedes-Benz Baureihe 500 -- neue V-Motorengeneration für schwere Nutzfahrzeuge, MTZ 57 Nr. 9, S. 460 ff., 1996

2. Robert Bosch GmbH (Hrsg.): Bremsanlagen für Kraftfahrzeuge, VDI-Verlag, Düsseldorf, 1. Auflage, 1994

3. Rubi, V., Strifler, P. (Hrsg. Institut für Kraftfahrwesen RWTH Aachen): Industrielle Nutzfahrzeugentwicklung, Schriftenreihe Automobiltechnik, 1993

T 7.154 Course: Fundamentals of Automobile Development I [T-MACH-105162]

Responsible: Dipl.-Ing. Rolf Frech
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	2113810	Fundamentals of Automobile Development I	1 SWS	Lecture (V)	Frech
WS 18/19	2113851	Principles of Whole Vehicle Engineering I	1 SWS	Lecture (V)	Frech
Exams					
WS 18/19	76-T-MACH-105162	Fundamentals of Automobile Development I		Prüfung (PR)	Frech, Unrau
SS 2019	76-T-MACH-105162	Fundamentals of Automobile Development I		Prüfung (PR)	Frech, Unrau

Competence Certificate
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals of Automobile Development I

2113810, WS 18/19, 1 SWS, Open in study portal **Lecture (V)**

Notes
Block lecture on two days. Room and data will be published on the homepage of the institute.

Learning Content
1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature
The scriptum will be provided during the first lessons

V

Principles of Whole Vehicle Engineering I

2113851, WS 18/19, 1 SWS, Open in study portal

Lecture (V)

Notes
Block lecture on two days. Room and data will be published on the homepage of the institute.

In English language.

Learning Content
1. Process of automobile development
2. Conceptual dimensioning and design of an automobile
3. Laws and regulations – National and international boundary conditions
4. Aero dynamical dimensioning and design of an automobile I
5. Aero dynamical dimensioning and design of an automobile II
6. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines I
7. Thermo-management in the conflict of objectives between styling, aerodynamic and packaging guidelines II

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature
The scriptum will be provided during the first lessons

T 7.155 Course: Fundamentals of Automobile Development II [T-MACH-105163]

Responsible: Dipl.-Ing. Rolf Frech
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	1,5	Each summer term	2

Events					
SS 2019	2114842	Fundamentals of Automobile Development II	1 SWS	Lecture (V)	Frech
SS 2019	2114860	Principles of Whole Vehicle Engineering II	1 SWS	Block lecture (BV)	Frech
Exams					
WS 18/19	76-T-MACH-105163	Fundamentals of Automobile Development II		Prüfung (PR)	Unrau, Frech
SS 2019	76-T-MACH-105163	Fundamentals of Automobile Development II		Prüfung (PR)	Frech, Unrau

Competence Certificate
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
none

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

V Fundamentals of Automobile Development II

2114842, SS 2019, 1 SWS, Open in study portal — **Lecture (V)**

Learning Content
1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

Workload
regular attendance: 10,5 hours
self-study: 49,5 hours

Literature
The scriptum will be provided during the first lessons.

V

Principles of Whole Vehicle Engineering II

2114860, SS 2019, 1 SWS, Open in study portal

Block lecture (BV)

Learning Content

1. Application-oriented material and production technology I
2. Application-oriented material and production technology II
3. Overall vehicle acoustics in the automobile development
4. Drive train acoustics in the automobile development
5. Testing of the complete vehicle
6. Properties of the complete automobile

Workload

regular attendance: 10,5 hours
self-study: 49,5 hours

Literature

The scriptum will be provided during the first lessons.

T 7.156 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 7.157 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 7.158 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 7.159 Course: Global Optimization I [T-WIWI-102726]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.160 Course: Global Optimization I and II [T-WIWI-103638]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.161 Course: Global Optimization II [T-WIWI-102727]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.162 Course: Global Production and Logistics - Part 1: Global Production [T-MACH-105158]

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

Part of: M-MACH-101282 - Globale Produktion und Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	2

Events					
WS 18/19	2149610	Global Production and Logistics - Part 1: Global Production	2 SWS	Lecture (V)	Lanza
Exams					
WS 18/19	76-T-MACH-105158	Global Production and Logistics - Part 1: Global Production		Prüfung (PR)	Lanza

Competence Certificate
Written Exam (60 min)

Prerequisites
"T-MACH-108848 - Globale Produktion und Logistik - Teil 1: Globale Produktion" must not be commenced.

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

V Global Production and Logistics - Part 1: Global Production

2149610, 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/)

Notes
Lectures on Mondays 14:00-15:30

Learning Content
Target of the lecture is to depict the challenges and fields of action of global operating companies and to give an overview of central aspects in global production networks as well as establishing a deepening knowledge of established methods and procedures for design and scale. Within the course methods for site selection, procedures for site specific adjustment of product construction and product technology as well as planning approaches to establish a new production site are imparted. The course is rounded off by showing the characteristics of the departments sale, procurement as well as research and development under global aspects. Moreover, the implementation of Industry 4.0 applications is discussed in the context of global production.
The topics are:

- Basic conditions and influencing factors of global production (historical development, targets, chances and threats)
- Global sales
- Site selection
- Site specific producion adjustment
- Establishing of new production sites
- Global procurement
- Design and management of global production networks
- Global research and development

Annotation
None

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

Literature
Lecture Notes
recommended secondary literature:
Abele, E. et al: Global Production – A Handbook for Strategy and Implementation, Springer 2008 (english)

T 7.163 Course: Global Production and Logistics - Part 2: Global Logistics [T-MACH-105159]

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

Part of: M-MACH-101282 - Globale Produktion und Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	1

Events					
SS 2019	2149600	Global Production and Logistics - Part 2: Global Logistics	2 SWS	Lecture (V)	Furmans
Exams					
WS 18/19	76-T-MACH-105159	Global Production and Logistics - Part 2: Global Logistics		Prüfung (PR)	Furmans
SS 2019	76-T-MACH-105159	Global Production and Logistics - Part 2: Global Logistics		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

Recommendation
We recommend attending the course "Logistics - organization, design and control of logistic systems " (2118078) beforehand.

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

V Global Production and Logistics - Part 2: Global Logistics

2149600, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations, black board

Learning Content
Characteristics of global trade

- Incoterms
- Customs clearance, documents and export control

Global transport and shipping

- Maritime transport, esp. container handling
- Air transport

Modeling of supply chains

- SCOR model
- Value stream analysis

Location planning in cross-border-networks

- Application of the Warehouse Location Problem
- Transport Planning

Inventory Management in global supply chains

- Stock keeping policies

Inventory management considering lead time and shipping costs

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

Literature
Elective literature:

- Arnold/Isermann/Kuhn/Tempelmeier. HandbuchLogistik, Springer Verlag, 2002 (Neuauflage in Arbeit)
- Domschke. Logistik, Rundreisen und Touren,Oldenbourg Verlag, 1982
- Domschke/Drexl. Logistik, Standorte, OldenbourgVerlag, 1996
- Gudehus. Logistik, Springer Verlag, 2007
- Neumann-Morlock. Operations-Research,Hanser-Verlag, 1993
- Tempelmeier. Bestandsmanagement in SupplyChains, Books on Demand 2006
- Schönsleben. IntegralesLogistikmanagement, Springer, 1998

T 7.164 Course: Graph Theory and Advanced Location Models [T-WIWI-102723]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	2

Exams				
WS 18/19	7900276	Graph Theory and Advanced Location Models	Prüfung (PR)	Nickel

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

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

Prerequisites
None

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

Annotation
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

T 7.165 Course: Handling Characteristics of Motor Vehicles I [T-MACH-105152]

Responsible: Dr.-Ing. Hans-Joachim Unrau
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	2113807	Handling Characteristics of Motor Vehicles I	2 SWS	Lecture (V)	Unrau
Exams					
WS 18/19	76-T-MACH-105152	Handling Characteristics of Motor Vehicles I		Prüfung (PR)	Unrau
SS 2019	76-T-MACH-105152	Handling Characteristics of Motor Vehicles I		Prüfung (PR)	Unrau

Competence Certificate
Verbally

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

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

V Handling Characteristics of Motor Vehicles I

2113807, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Problem definition: Control loop driver - vehicle - environment (e.g. coordinate systems, modes of motion of the car body and the wheels)

2. Simulation models: Creation from motion equations (method according to D'Alembert, method according to Lagrange, programme packages for automatically producing of simulation equations), model for handling characteristics (task, motion equations)

3. Tyre behavior: Basics, dry, wet and winter-smooth roadway

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
1. Willumeit, H.-P.: Modelle und Modellierungsverfahren in der Fahrzeugdynamik,
B. G. Teubner Verlag, 1998

2. Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004

3. Gnadler, R.; Unrau, H.-J.: Reprint collection to the lecture Handling Characteristics of Motor Vehicles I

T 7.166 Course: Handling Characteristics of Motor Vehicles II [T-MACH-105153]

Responsible: Dr.-Ing. Hans-Joachim Unrau
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2114838	Handling Characteristics of Motor Vehicles II	2 SWS	Lecture (V)	Unrau
Exams					
WS 18/19	76-T-MACH-105153	Handling Characteristics of Motor Vehicles II		Prüfung (PR)	Unrau
SS 2019	76-T-MACH-105153	Handling Characteristics of Motor Vehicles II		Prüfung (PR)	Unrau

Competence Certificate
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

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

V Handling Characteristics of Motor Vehicles II

2114838, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Vehicle handling: Bases, steady state cornering, steering input step, single sine, double track switching, slalom, cross-wind behavior, uneven roadway

2. stability behavior: Basics, stability conditions for single vehicles and for vehicles with trailer

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
1. Zomotor, A.: Fahrwerktechnik: Fahrverhalten, Vogel Verlag, 1991

2. Mitschke, M./Wallentowitz, H.: Dynamik von Kraftfahrzeugen, Springer-Verlag, Berlin, 2004

3. Gnadler, R. Unrau, H.-J.: Reprint collection to the lecture Handling Characteristics of Motor Vehicles II

T 7.167 Course: Heat Economy [T-WIWI-102695]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101452 - Energiewirtschaft und Technologie
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Exams				
WS 18/19	7981001	Heat Economy	Prüfung (PR)	Fichtner

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

Prerequisites
None.

Recommendation
None

Annotation
See German version.

T 7.168 Course: High Performance Powder Metallurgy Materials [T-MACH-102157]

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

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2126749	Advanced powder metals	2 SWS	Lecture (V)	Schell
Exams					
SS 2019	76-T-MACH-102157	High Performance Powder Metallurgy Materials		Prüfung (PR)	Schell

Competence Certificate
oral exam, 20- 30 min

Prerequisites
none

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

V Advanced powder metals

2126749, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The lecture gives an overview on production, properties and application of structural and functional powder metallurgy material. The following groups of materials are presented: PM High Speed Steels, Cemented Carbides, PM Metal Matrix Composites, PM Specialities, PM Soft Magnetic and Hard Magnetic Materials.

Workload
regular attendance: 22 hours
self-study: 98 hours

Literature

- W. Schatt ; K.-P. Wieters ; B. Kieback. ".Pulvermetallurgie: Technologien und Werkstoffe", Springer, 2007
- R.M. German. "Powder metallurgy and particulate materials processing. Metal Powder Industries Federation, 2005
- F. Thümmler, R. Oberacker. "Introduction to Powder Metallurgy", Institute of Materials, 1993

T 7.169 Course: High-Voltage Technology I [T-ETIT-101913]

Responsible: Dr.-Ing. Rainer Badent
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101163 - Hochspannungstechnik
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	2307360	Hochspannungstechnik I	2 SWS	Lecture (V)	Badent
WS 18/19	2307362	Übungen zu 2307360 Hochspannungstechnik I	1 SWS	Practice (Ü)	Maier
Exams					
WS 18/19	7307360	High-Voltage Technology I		Prüfung (PR)	Badent
SS 2019	7307360	High-Voltage Technology I		Prüfung (PR)	Badent

Prerequisites
none

T 7.170 Course: High-Voltage Technology II [T-ETIT-101914]

Responsible: Dr.-Ing. Rainer Badent
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101163 - Hochspannungstechnik
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
SS 2019	2307361	High-Voltage Technology II	2 SWS	Lecture (V)	Badent
SS 2019	2307363	Übungen zu 2307361 Hochspannungstechnik II	1 SWS	Practice (Ü)	Schulze
Exams					
WS 18/19	7307361	High-Voltage Technology II		Prüfung (PR)	Badent
SS 2019	7307361	High-Voltage Technology II		Prüfung (PR)	Badent

Prerequisites
none

T 7.171 Course: High-Voltage Test Technique [T-ETIT-101915]

Responsible: Dr.-Ing. Rainer Badent
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101164 - Erzeugung und Übertragung regenerativer Energie
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2307392	Hochspannungsprüftechnik	2 SWS	Lecture (V)	Badent
WS 18/19	2307394	Übungen zu 2307392 Hochspannungsprüftechnik	1 SWS	Practice (Ü)	Görtz
Exams					
WS 18/19	7307392	High-Voltage Test Technique		Prüfung (PR)	Badent

Prerequisites
none

T 7.172 Course: Human Factors in Security and Privacy [T-WIWI-109270]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511554	Human Factors in Security and Privacy	2 SWS	Lecture (V)	Volkamer
WS 18/19	2511555	Übungen zu Human Factors in Security and Privacy	1 SWS	Practice (Ü)	Volkamer
Exams					
WS 18/19	7900113	Human Factors in Security and Privacy		Prüfung (PR)	Volkamer
SS 2019	7900084	Human Factors in Security and Privacy		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
Successful participation in the exercises.

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

V Human Factors in Security and Privacy

2511554, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

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

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

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

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

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

Learning Content
This lecture and the corresponding exercises discuss the various problems of existing security and privacy mechanisms and security and privacy awareness/education/training approaches. The lecture addresses relevant psychological and sociological aspects which are important to know and to consider when developing more usable security/privacy mechanisms and more effective awareness/education/training approaches. This includes the importance of mental models. The human centered security and privacy by design approach is introduced. Furthermore, some of the methodologies used in this area are explained and a subset of them is also applied. Finally, positive examples, such as graphical passwords, are introduced and discussed. Note, the main part of the exercise is replicating an interview based study.

Literature

- Usable Security: History, Themes, and Challenges (Synthesis Lectures on Information Security, Privacy, and Trust): Simson Garfinkel und Heather Richter Lipford. 2014
- Security and Usability: Designing Secure Systems that People Can Use von Lorrie Faith Cranor und Simson Garfinkel. 2005
- Melanie Volkamer, Karen Renaud: Mental Models - General Introduction and Review of Their Application to Human-Centred Security. In Number Theory and Cryptography (2013): 255-280: https://link.springer.com/chapter/10.1007/978-3-642-42001-6_18
- Paul Gerber, Marco Ghiglierie, Birgit Henhapl, Oksana Kulyk, Karola Marky, Peter Mayer, Benjamin Reinheimer, Melanie Volkamer: Human Factors in Security. In: Reuter C. (eds) Sicherheitskritische Mensch-Computer-Interaktion. Springer (2018) https://link.springer.com/chapter/10.1007/978-3-658-19523-6_5
- Bruce Schneier: Psychology of Security (2018): https://www.schneier.com/essays/archives/2008/01/the_psychology_of_se.html
- Ross Anderson: security /usability and psychology. In Security Engineering. http://www.cl.cam.ac.uk/~rja14/Papers/SEv2-c02.pdf
- Andrew Odlyzko: Economics, Psychology and Sociology of Security: http://www.dtc.umn.edu/~odlyzko/doc/econ.psych.security.pdf

T 7.173 Course: Incentives in Organizations [T-WIWI-105781]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101500 - Microeconomic Theory
M-WIWI-101505 - Experimentelle Wirtschaftsforschung
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104908 - Volkswirtschaftslehre

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

Events					
SS 2019	2573003	Incentives in Organizations	2 SWS	Lecture (V)	Nieken
SS 2019	2573004	Übung zu Incentives in Organizations	1 SWS	Practice (Ü)	Nieken, Mitarbeiter
Exams					
WS 18/19	7900201	Incentives in Organizations		Prüfung (PR)	Nieken

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

In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Prerequisites
None

Recommendation
Knowledge of microeconomics, game theory, and statistics is assumed.

Annotation
The course is carried out routinely in summer.

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

V Incentives in Organizations
2573003, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The students acquire profound knowledge about the design and the impact of different incentive and compensation systems. Topics covered are, for instance, performance based compensation, team work, intrinsic motivation, multitasking, and subjective performance evaluations. We will use microeconomic or behavioral models as well as empirical data to analyze incentive systems. We will investigate several widely used compensation schemes and their relationship with corporate strategy. Students will learn to develop practical implications which are based on the acquired knowledge of this course.

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

Literature (mandatory): Slides, case studies, and selected research papers annolunced in the lecture

Literature (additional):

Brickley / Smith / Zimmerman: Managerial Economics and Organizantional Architecture

Camerer: Behavioral Game Theory

Lazear / Gibbs: Personnel Economics in Practice

Wooldridge: Introduction to Econometrics

Wooldridge: Econometric Analysis of Cross Section and Panel Data

T 7.174 Course: Industrial Services [T-WIWI-102822]

Responsible: Prof. Dr. Hansjörg Fromm
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101448 - Service Management
M-WIWI-101506 - Service Analytics
M-WIWI-102808 - Digital Service Systems in Industry
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2595505	Industrial Services	2 SWS	Lecture (V)	Fromm
WS 18/19	2595506	Übungen zu Industrial Services	1 SWS	Practice (Ü)	Walk
Exams					
WS 18/19	7900241	Industrial Services		Prüfung (PR)	Fromm

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

Prerequisites
None

Recommendation
None

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

V Industrial Services
2595505, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Services are becoming ever more important in business. Today, the gross income share of services in Germany exceeds 70%. Following this trend, many companies that previously focused solely on the sale of goods, strive to an extension of their business model: In order to realize new competitive advantages in domestic and international markets, they enrich their material goods with customer-specific services. This transformation to a provider of integrated solutions is called "Servitization" (Neely 2009). For this reason, so-called industrial services to companies of increasing importance. They benefit from the increasingly detailed data collected (on "Big Data"), e.g. concerning user profiles, failure statistics, usage history, accrued expenses, etc. Only these data allow in principle to end products and spare parts are delivered faster, cheaper and more targeted and technicians can be used more efficiently with the correct skills. This requires, however, also suitable methods of optimization, prognosis or predictive modeling. When used properly, such methods can minimize logistics costs, increase availability, prevent potential failures and improve repair planning. This is also enabled by latest "Technology Enabled Services" along with corresponding data transfer and analysis ("Internet of Things", automatic error detection, remote diagnostics, centralized collection of consumption data, etc.). The change from goods manufacturer to a provider of integrated solutions requires new services, transformation of business models as well as intelligent new contract types, which are addressed in the course as well.

More specifically, the lessons of this lecture will include:

- Servitization – The Manufacturer's Transformationto Integrated Solution Provider
- Service Levels – Definitions, Agreements, Measurements and Service Level Engineering
- The "Services Supply Chain"
- Spare Parts Planning – Forecasting, Assortment Planning, Order Quantities and Safety Stocks
- Distribution Network Planning – Network Types, Models, Optimization
- Service Technician Planning
- Condition Monitoring, Predictive Maintenance, Diagnose Systems
- Call Center Services
- Full Service Contracts
- IT-enabled Value-Add Services – Industrial Service Innovation

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

Literature
Silver, E. A., Pyke, D. F., & Peterson, R. (1998). *Inventory management and production planning and scheduling* (Vol. 3, p. 30). New York: Wiley.

Pintelon, L., & Van Puyvelde, F. (2013). *Asset Management. The Maintenance Perspective*. Acco.

Chopra, S., & Meindl, P. (2007). Supply chain management. Strategy, planning & operation. In *Das summa summarum des management* (pp. 265-275). Gabler.

Koole, G. (2007). Call Center Mathematics: A scientific method for understanding and improving contact centers. *Departement of Mathematics, Vrije Universiteit, Amsterdam*.

Oliva, R., & Kallenberg, R. (2003). Managing the transition from products to services. *International journal of service industry management*, *14*(2), 160-172.

T 7.175 Course: Information Engineering [T-MACH-102209]

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

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
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 7.176 Course: Information Management for Public Mobility Services [T-BGU-106608]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	6232813	Informationsmanagement für öffentliche Mobilitätsangebote	2 SWS	Block (B)	Vortisch

Competence Certificate
lecture accompanying exercises, appr. 5 pieces

Prerequisites
none

Recommendation
none

Annotation
none

T 7.177 Course: Information Service Engineering [T-WIWI-106423]

Responsible: Prof. Dr. Harald Sack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	1

Events					
SS 2019	2511606	Information Service Engineering	2 SWS	Lecture (V)	Sack
SS 2019	2511607	Übungen zu Information Service Engineering	1 SWS	Practice (Ü)	Sack
Exams					
WS 18/19	7900071	Information Service Engineering		Prüfung (PR)	Sack
SS 2019	7900070	Information Service Engineering		Prüfung (PR)	Sack

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None

Annotation
New course starting summer term 2017.

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

V Information Service Engineering

2511606, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
- Information, Natural Language and the Web

- Natural Language Processing

  - NLP and Basic Linguistic Knowledge
  - NLP Applications, Techniques & Challenges
  - Evaluation, Precision and Recall
  - Regular Expressions and Automata
  - Tokenization
  - Language Model and N-Grams
  - Part-of-Speech Tagging

- Linked Data Engineering

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

- Information Retrieval

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

- Knowledge Mining

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

- Exploratory Search and Recommender Systems

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

Annotation
New lecture, since summer semester 2017

Literature

- D. Jurafsky, J.H. Martin, Speech and Language Processing, 2nd ed. Pearson Int., 2009.
- S. Hitzler, S. Rudolph, Foundations of Semantic Web Technologies, Chapman / Hall, 2009.
- R. Baeza-Yates, B. Ribeiro-Neto, Modern Information Retrieval, 2nd ed., Addison Wesley, 2010.#

T 7.178 Course: Information Systems and Supply Chain Management [T-MACH-102128]

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

Part of: M-MACH-101263 - Einführung in die Logistik
M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
M-MACH-101282 - Globale Produktion und 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 7.179 Course: Infrastructure Management [T-BGU-106300]

Responsible: Prof. Dr.-Ing. Ralf Roos
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-100998 - Entwurf, Bau, Betrieb und Erhaltung von Straßen
M-BGU-100999 - Straßenwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each term	1

Events					
SS 2019	6233801	Entwurf und Bau von Straßen	2 SWS	Lecture (V)	Roos
SS 2019	6233802	Betrieb und Erhaltung von Straßen	2 SWS	Lecture (V)	Roos
Exams					
WS 18/19	8245106300	Infrastructure Management		Prüfung (PR)	Roos

Competence Certificate
written exam, 120 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.180 Course: Innovation Management: Concepts, Strategies and Methods [T-WIWI-102893]

Responsible: Prof. Dr. Marion Weissenberger-Eibl
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2545100	Innovation Management: Concepts, Strategies and Methods	2 SWS	Lecture (V)	Weissenberger-Eibl
Exams					
SS 2019	7900144	Innovation Management: Concepts, Strategies and Methods		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900145	Innovation Management: Concepts, Strategies and Methods		Prüfung (PR)	Weissenberger-Eibl

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

Prerequisites
None

Recommendation
None

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

V Innovation Management: Concepts, Strategies and Methods

2545100, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Notes
The lecture will be held in German.

Learning Content
The course 'Innovation Management: Concepts, Strategies and Methods' offers scientific concepts which facilitate the understanding of the different phases of the innovation process and resulting strategies and appropriate methodologies suitable for application.

The concepts refer to the entire innovation process so that an integrated perspective is made possible. This is the basis for the teaching of strategies and methods which fulfil the diverse demands of the complex innovation process. The course focuses particu-larly on the creation of interfaces between departments and between various actors in a company's environment and the organisation of a company's internal procedures. In this context a basic understanding of knowledge and communication is taught in addi-tion to the specific characteristics of the respective actors. Subsequently methods are shown which are suitable for the profitable and innovation-led implementation of inte-grated knowledge.

Annotation
This course was formerly named "Innovation Management".

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

Literature
A detailed bibliography is provided with the lecture notes.

T 7.181 Course: Innovationtheory and -Policy [T-WIWI-102840]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101478 - Innovation und Wachstum
M-WIWI-101497 - Agglomeration und Innovation
M-WIWI-101514 - Innovationsökonomik
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2560236	Innovationtheory and -policy	SWS	Lecture (V)	Ott
SS 2019	2560237	Übung zu Innovationstheorie und -politik	SWS	Practice (Ü)	Ott, Eraydin
Exams					
WS 18/19	7900077	Innovationtheory and -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.
Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

Prerequisites
None

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

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

V Innovationtheory and -policy

2560236, SS 2019, SWS, Open in study portal **Lecture (V)**

Learning Content

- Incentives for the emergence of innovations
- Patents
- Diffusion
- Impact of technological progress
- Innovation Policy

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

Literature
Excerpt:

- Aghion, P., Howitt, P. (2009), The Economics of Growth, MIT Press, Cambridge MA.
- de la Fuente, A. (2000), Mathematical Methods and Models for Economists. Cambridge University Press, Cambridge, UK.
- Klodt, H. (1995), Grundlagen der Forschungs- und Technologiepolitik. Vahlen, München.
- Linde, R. (2000), Allokation, Wettbewerb, Verteilung - Theorie, UNIBUCH Verlag, Lüneburg.
- Ruttan, V. W. (2001), Technology, Growth, and Development. Oxford University Press, Oxford.
- Scotchmer, S. (2004), Incentives and Innovation, MIT Press.
- Tirole, Jean (1988), The Theory of Industrial Organization, MIT Press, Cambridge MA.

T 7.182 Course: Insurance Marketing [T-WIWI-102601]

Responsible: Edmund Schwake
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

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

Competence Certificate
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Prerequisites
None

Recommendation
None

T 7.183 Course: Insurance Production [T-WIWI-102648]

Responsible: Prof. Dr. Ute Werner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	Irregular	1

Competence Certificate
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

T-WIWI-102648 Insurance Production will be offered latest until summer term 2017 (beginners only).

Prerequisites
None

Recommendation
None

Annotation
This course is offered on demand. For further information, see: http://insurance.fbv.kit.edu

T 7.184 Course: Insurance Risk Management [T-WIWI-102636]

Responsible: Harald Maser
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	2,5	Each summer term	1

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

T-WIWI-102636 Insurance Risk Management will be offered as a seminar starting summer term 2017. The examination will be offered latest until summer term 2017 (beginners only).

Prerequisites
None

Recommendation
None

Annotation
Block course. For organizational reasons, please register with the secretary of the chair: thomas.mueller3@kit.edu.

T 7.185 Course: Integrated Product Development [T-MACH-105401]

Responsible: Prof. Dr.-Ing. Albert Albers
Albers Assistenten

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-102626 - Schwerpunkt: Integrierte Produktentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	16	Each winter term	1

Events					
WS 18/19	2145156	Integrated Product Development	4 SWS	Lecture (V)	Albers
WS 18/19	2145157	Workshop Product Development	4 SWS	Practice (Ü)	Albers, Mitarbeiter
WS 18/19	2145300	Project Work in Product Development	2 SWS	Others (sonst.)	Albers
Exams					
WS 18/19	7600021	Integrated Product Development		Prüfung (PR)	Albers

Competence Certificate
oral examination (60 minutes)

Prerequisites
none

Annotation
Due to organizational reasons, the number of participants is limited. Thus a selection has to be made. For registration to the selection process a standard form has to be used, that can be downloaded from IPEK hompage from april to july. The selection itself is made by Prof. Albers in personal interviews.

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

V Integrated Product Development

2145156, WS 18/19, 4 SWS, Open in study portal — **Lecture (V)**

Learning Content
organizational integration: integrated product engineering model, core team management and simultaneous engineering
informational integration: innovation management, cost management, quality management and knowledge management

personal integration: team coaching and leadership management

invited lectures

Annotation
The lecture starts in first week of October.

Workload
regular attendance: 84 h
self-study: 288 h

Literature
Klaus Ehrlenspiel - Integrierte Produktentwicklung. Denkabläufe, Methodeneinsatz, Zusammenarbeit, Hanser Verlag, 2009

V Workshop Product Development

2145157, WS 18/19, 4 SWS, Open in study portal

Practice (Ü)

Learning Content
problem solving: analysis techniques, creativity techniques and evaluation methods

professional skills: presentation techniques, moderation and teamcoaching

development tools: MS Project, Szenario-Manager & Pro/Engineer Wildfire

Workload
lectures: 21 h

preparation to exam: 99 h

Literature
none

V Project Work in Product Development

2145300, WS 18/19, 2 SWS, Open in study portal

Others (sonst.)

Learning Content
The project work begins with the early stages of product development, i.e. the identification of market trends and needs. Based on this information the students develop scenarios for future markets and create product profiles, which describe the customers and their demands without anticipating possible product solutions. After having passed several following milestones for ideas, concepts and designs, virtual prototypes and function prototypes are presented to an audience.
The project work is supported by coaching through skilled faculty staff. Additionally weekly tutorials, respectively workshops are given. For doing the project the teams gain access to team workspaces featuring IT-infrastructure and relevant software, such as office, CAD or FEA. Further on the teams learn how team cooperation and knowledge management can be supported in design project by using a wiki system.

Workload
regular attendance: 21 h

self-study: 99 h

T 7.186 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 7.187 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-101282 - Globale Produktion und Logistik
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 7.188 Course: Intelligent CRM Architectures [T-WIWI-103549]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2540525	Intelligent CRM Architectures	2 SWS	Lecture (V)	Geyer-Schulz
WS 18/19	2540526	Übung zu Intelligent CRM Architectures	1 SWS	Practice (Ü)	Ball
Exams					
WS 18/19	79011480	Intelligent CRM Architectures		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
It is recommended to additionally review the Bachelor-level lecture "Customer Relationship Management" from the module "CRM and Servicemanagement".

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

V Intelligent CRM Architectures

2540525, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The lecture is structured in three parts:

In the first part the methods used for architecture design are introduced (system analysis, UML, formal specification of interfaces, software and analysis patterns, and the separation in conceptual and IT-architectures. The second part is dedicated to learning architectures and machine learning methods. The third part presents examples of learning CRM-Architectures.

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

Time of attendance

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

Self-study

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

Sum: 135h 00m

Literature

- P. Clements *et al.*, *Documenting Software Architectures. Views and Beyond*. Upper Saddle River: Addison-Wesley, 2011.
- M. Fowler, *Patterns of Enterprise Application Architecture*. Amsterdam: Addison-Wesley Longman, 2002.
- S. Russell and P. Norvig, *Artificial Intelligence: A Modern Approach*, 3rd ed. Harlow Essex England: Pearson New International Edition, 2014.
- V. N. Vapnik, *The Nature of Statistical Learning Theory*. New York: Springer, 1995.

T 7.189 Course: Interactive Information Systems [T-WIWI-108461]

Responsible: Prof. Dr. Alexander Mädche
Dr. Stefan Morana

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-104068 - Information Systems in Organizations
M-WIWI-104080 - Designing Interactive Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540558	Interactive Systems	3 SWS	Lecture (V)	Mädche, Morana
Exams					
WS 18/19	7900228	Interactive Information Systems		Prüfung (PR)	Mädche

Competence Certificate
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.
Students receive one aggregated grade consisting of a written exam (70%) and research paper (30%). The exam and the research paper need to be both passed. A fail in one element results in a fail of the entire lecture. There will be one retake possibility for the exam, no retake possibilities will be provided for the research paper.

Prerequisites
None

Annotation
This course replaces T-WIWI-106342 "Interactive Systems" starting summer term 2018.
The course is held in english.

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

V Interactive Systems

2540558, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

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

With the continuous growing capabilities of computers, the design of the interaction between human and computer becomes even more important. The aim of this course is to introduce the foundations, theoretical grounding, key concepts and principles as well as current practice of interactive systems. The contents of the course abstract from the technical implementation details. The students get the necessary knowledge to guide the successful implementation of interactive systems in business and private life.

Notes
The lecture is complemented with a capstone project assignment, where students analyze and review existing interactive systems and suggest areas of improvement / extensions.

Learning Content
· Basics
· Theoretical foundations
· Key concepts and design principles for specific interactive systems classes
· Capstone project

Literature

The lecture bases to a large extend on

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

Additional literature will be provided in the lecture.

T 7.190 Course: International Finance [T-WIWI-102646]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101483 - Finance 2
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 7.191 Course: International Management in Engineering and Production [T-WIWI-102882]

Responsible: Dr. Henning Sasse
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2581956	International Management in Engineering and Production	2 SWS	Lecture (V)	Sasse
Exams					
WS 18/19	7981956	International Management in Engineering and Production		Prüfung (PR)	Schultmann

Competence Certificate
The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Prerequisites
None

Recommendation
None

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

V International Management in Engineering and Production

2581956, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content

- Fundamentals of international business
- Forms of international cooperation and value creation
- Site selection
- Cost driven internationalization and site selection
- Sales and customer driven internationalization and site selection
- Challenges, risks and risk mitigation
- Management of international production sites
- Types and case studies of international production

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

Literature
Will be announced in the course.

T 7.192 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 7.193 Course: Introduction to Ceramics [T-MACH-100287]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	6	Each winter term	1

Events					
WS 18/19	2125757	Introduction to Ceramics	3 SWS	Lecture (V)	Hoffmann
Exams					
WS 18/19	76-T-MACH-100287	Introduction to Ceramics		Prüfung (PR)	Hoffmann, Schell, Wagner
SS 2019	76-T-MACH-100287	Introduction to Ceramics		Prüfung (PR)	Hoffmann, Schell, Wagner

Competence Certificate
The assessment consists of an oral exam (30 min) taking place at a specific date.

The re-examination is offered at a specific date.

Prerequisites
None

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

V Introduction to Ceramics

2125757, WS 18/19, 3 SWS, Open in study portal **Lecture (V)**

Description
Media:

Slides for the lecture:

available under http://www.iam.kit.edu/km

Learning Content
After a short introduction to interatomic bonding, fundamental concepts of crystallography, the stereographic projection and the most important symmetry elements will be given. Different types of crystal structures are explained and the relevance of imperfections are analysed with respect to the mechanical and electrical properties of ceramics. Then, the impact of surfaces, interfaces and grain boundaries for the preparation, microstructural evolution and the resulting properties is discussed. Finally, an introduction is given to ternary phase diagrams.

The second part of the course covers structure, preparation and application aspects of nonmetallic inorganic glasses, followed by an introduction to the properties and processing methods of fine-grained technical powders. The most relevant shaping methods, such as pressing, slip casting, injection moulding and extrusion are introduced. Subsequently, the basics of science of sintering and the mechanisms for normal and abnormal grain growth are discussed. Mechanical properties of ceramics are analysed using basic principles of linear elastic fracture mechanics, Weibull statistics, concepts for subcritical crack growth and creep models to explain the behaviour at elevated temperatures. Furthermore it is demonstrated that mechanical properties can be siginificantly enhanced by various types of microstructural toughening mechanisms. The electronic and ionic conductivity of ceramic materials are explained based on defect-chemical considerations and band structure models. Finally, the characteristics of a dielectric, pyroelectric, and piezoelectric behaviour is discussed.

Workload
regular attendance: 45 hours
self-study: 135 hours

Literature

- H. Salmang, H. Scholze, "Keramik", Springer
- Kingery, Bowen, Uhlmann, "Introduction To Ceramics", Wiley
- Y.-M. Chiang, D. Birnie III and W.D. Kingery, "Physical Ceramics", Wiley
- S.J.L. Kang, "Sintering, Densification, Grain Growth & Microstructure", Elsevier

T 7.194 Course: Introduction to Hydrogeology [T-BGU-101499]

Responsible: Prof. Dr. Nico Goldscheider
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each winter term	1

Events					
WS 18/19	6339050	Grundlagen der Hydrogeologie (Studienplan 2009 G10-1, G10-2)	4 SWS	Lecture / Practice (VÜ)	Goldscheider
Exams					
WS 18/19	8210_101499	Introduction to Hydrogeology		Prüfung (PR)	Goldscheider

Competence Certificate
Written exam with 90 minutes

Prerequisites
none

T 7.195 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 7.196 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 7.197 Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
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 7.198 Course: IoT platform for engineering [T-MACH-106743]

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

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2123352	IoT platform for engineering	SWS	Project/Seminar (PJ/S)	Ovtcharova, Maier
SS 2019	2123352	IoT platform for engineering	3 SWS	Project/Seminar (PJ/S)	Ovtcharova, Maier
Exams					
WS 18/19	76T-MACH-106743	IoT platform for engineering		Prüfung (PR)	Ovtcharova

Competence Certificate
Assessment of another type (graded), procedure see webpage. Number of participants limited to 20 people. There is a participant selection process.

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

V IoT platform for engineering
2123352, WS 18/19, SWS, Open in study portal — **Project/Seminar (PJ/S)**

Learning Content
Industry 4.0, IT systems for fabrication and assembly, process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

V IoT platform for engineering
2123352, SS 2019, 3 SWS, Open in study portal — **Project/Seminar (PJ/S)**

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

T 7.199 Course: IT- Security Law [T-INFO-109910]

Responsible: PD Dr. Oliver Raabe
Organisation: KIT Department of Informatics
Part of: M-INFO-101242 - Governance, Risk & Compliance

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2400007	IT SECURITY LAW	2 SWS	Lecture (V)	Raabe

T 7.200 Course: IT-Based Road Design [T-BGU-101804]

Responsible: Dr.-Ing. Matthias Zimmermann
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101066 - Sicherheit, EDV und Recht im Straßenwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6233901	DV-gestützter Straßenentwurf	2 SWS	Lecture / Practice (VÜ)	Zimmermann
Exams					
WS 18/19	8240101804	IT-Based Road Design		Prüfung (PR)	Zimmermann

Competence Certificate
oram exam with 15 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.201 Course: IT-Fundamentals of Logistics [T-MACH-105187]

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

Part of: M-MACH-101263 - Einführung in die Logistik
M-MACH-101279 - Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	2

Events					
SS 2019	2118183	IT-Fundamentals of Logistics	2 SWS	Lecture (V)	Thomas
Exams					
WS 18/19	76-T-MACH-105187	IT-Fundamentals of Logistics		Prüfung (PR)	Furmans, Mittwollen
SS 2019	76-T-MACH-105187	IT-Fundamentals of Logistics		Prüfung (PR)	Furmans, Mittwollen

Competence Certificate
The assessment consists of an oral exam (30min) taking place in the recess period according to § 4 paragraph 2 Nr. 2 of the examination regulation.

Prerequisites
none

Annotation
1) Detailed script can be downloaded online (www.tup.com), updated and enhanced annually.

2) CD-ROM with chapters and exercises at the end of the semester available from the lecturer, also updated and enhanced annually.

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

V IT-Fundamentals of Logistics

2118183, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The rapid development of information technology influences business processes drastically.
A strategic IT-orientation for an enterprise without a critical appreciation of worldwide IT-development (where the half-life value of IT for logistic systems knowledge is less than 3 years) is dangerous. The pressure of costs is always in focus. For this purpose the contents of this course, as well as the detailed script will be continuously revised, and the influences on business processes will be shown in practical examples.

Focuses:

- **System architecture in Material Flow Control Systems (MFCS)**

A guiding principle for a new system architecture for MFC systems is the consideration of making new standardized, functional groups available for re-usability.

- **Design and application of innovative Material Flow Control Systems (MFCS)**

The most important task of the MFCS is the commissioning of conveying systems with driving commands in a way that optimally utilizes the facility and serves the logistics processes on schedule.

- **Identification of goods – Application in Logistics**

Along with business processes, coded information is the link between the flow of information and the flow of materials, and contributes to error prevention in the communication between people and machines.

- **Data communication in Intra-logistics**

Information describes the content of a message that is of value to the recipient.
The recipient can be both a human and a machine.

- **Business processes for Intra-logistics – Software follows function!**

If the business processes from Goods Incoming to Goods Outgoing are adapted with reusable building blocks then capabilities become visible. Against this background the consideration becomes apparent, how, through an innovative software architecture,
a reusable building-block based framework can be made.
Therefore applies: Software follows function. And only if all project requirements are documented in the planing phase, and supported together in an inter-disciplinary team - consisting of logistics planners, the customers (users) and the implementation leader (IL).

- **Software development in accordance with industrial standards**

Today's development of object-oriented software, and the increasing penetration of industrial software production with this technology, makes it possible to create system designs that already offer these opportunities in their facility - both for a high degree of reuse and for easier adaptability.
In software development, object-oriented methods are used to improve the productivity, maintainability and software quality. An important aspect of object-orientation is: the objects used are primarily intended to depict the real world.

Annotation
1) Detailed script can be downloaded online (www.tup.com), updated and enhanced annually.
2) CD-ROM with chapters and exercises at the end of the semester available from the lecturer, also updated and enhanced annually.

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

T 7.202 Course: Joint Entrepreneurship Summer School [T-WIWI-109064]

Responsible: Prof. Dr. Orestis Terzidis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	6	Irregular	1

Competence Certificate
The learning control of the program (Summer School) consists of two parts:
A) **Investor Pitch**:
Based on a presentation (investor pitch) in front of a jury, the insights gained and developed during the course of the event are presented and the business idea presented. Among other things, the presentation performance of the team, the structured content and the logical consistency of the business idea are evaluated. The exact evaluation criteria will be announced in the course.

B) **Written elaboration:**
The second part of the assessment is a written report. The iterative knowledge gain of the entire event is systematically logged and can be further supplemented by the contents of the presentation. The report documents key action steps, applied methods, findings, market analyzes and interviews and prepares them in writing. The exact structure and requirements will be announced in the course.

The grade consists of 50% presentation performance and 50% written preparation.

Prerequisites
The Summer School is aimed at master students of KIT. Prerequisite is the participation in the selection process.

Recommendation
We recommend basic business knowledge, the lecture Entrepreneurship as well as openness and interest in intercultural exchange. Solid knowledge of the English language is an advantage.

Annotation
The working language during the Summer School is English. A one-week stay in China is part of the Summer School.

T 7.203 Course: Knowledge Discovery [T-WIWI-102666]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511302	Knowledge Discovery	2 SWS	Lecture (V)	Sure-Vetter, Rettinger
WS 18/19	2511303	Exercises to Knowledge Discovery	1 SWS	Practice (Ü)	Sure-Vetter, Rettinger, Thoma, Weller
Exams					
WS 18/19	7900013	Knowledge Discovery		Prüfung (PR)	Sure-Vetter
SS 2019	7900039	Knowledge Discovery		Prüfung (PR)	Sure-Vetter

Competence Certificate
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation.

Students can be awarded a bonus on their final grade if they successfully complete special assignments.

Prerequisites
None

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

V Knowledge Discovery

2511302, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Knowledge discovery is a well-established field with a large community investigating methods for the discovery of patterns and regularities in large data sets, including relational databases and unstructured text.

A variety of methods are available to assist in extracting patterns that, if interpreted, provide valuable, possibly previously unknown, insights. This information can be predictive or descriptive in nature.

This lecture provides an overview of this field. The lecture imparts specific techniques and methods, challenges and current and future research workin this field.

Learning Content
Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empircial evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others feauturevector-based learning, text mining and social network analysis.

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

- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (http://www-stat.stanford.edu/~tibs/ElemStatLearn/)
- T. Mitchell. Machine Learning. 1997
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley

V Exercises to Knowledge Discovery

2511303, WS 18/19, 1 SWS, Open in study portal

Practice (Ü)

Description
Multiple exercises are held that capture the topics, held in the lecture Knowledge Discovery, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

Learning Content
Topics of the lectures comprise the whole Machine Learning and Data Mining process like CRISP, data warehousing, OLAP-techniques, learning algorithms, visualization and empircial evaluation. Covered learning techniques range from traditional approaches like decision trees, neural networks and support vector machines to selected approaches resulting from current research. Discussed learning problems are amongst others feauturevector-based learning, text mining and social network analysis.

Workload
The total workload for the lecture Knowledge Discovery is given out on the description of the lecture.

Literature

- T. Hastie, R. Tibshirani, J. Friedman. The Elements of Statistical Learning: Data Mining, Inference, and Prediction (http://www-stat.stanford.edu/~tibs/ElemStatLearn/)
- T. Mitchell. Machine Learning. 1997
- M. Berhold, D. Hand (eds). Intelligent Data Analysis - An Introduction. 2003
- P. Tan, M. Steinbach, V. Kumar: Introduction to Data Mining, 2005, Addison Wesley

T 7.204 Course: Laboratory Laser Materials Processing [T-MACH-102154]

Responsible: Dr.-Ing. Johannes Schneider
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	4	Each term	2

Events					
WS 18/19	2183640	Laboratory "Laser Materials Processing"	3 SWS	Practical course (P)	Schneider, Pfleging
SS 2019	2183640	Laboratory "Laser Materials Processing"	3 SWS	Practical course (P)	Schneider, Pfleging
Exams					
WS 18/19	76-T-MACH-102154	Laboratory Laser Materials Processing		Prüfung (PR)	Schneider
SS 2019	76-T-MACH-102154	Laboratory Laser Materials Processing		Prüfung (PR)	Schneider

Competence Certificate
The assessment consists of a colloquium for every single experiment and an overall final colloquium incl. an oral presentation of 20 min.

Prerequisites
none

Recommendation
basic knowledge of physics, chemistry and material science

The attendance to one of the courses Physical Basics of Laser Technology (2181612) or Laser Application in Automotive Engineering (2182642) is strongly recommended.

Annotation
The maximum number of students is 12 per semester.

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

V Laboratory "Laser Materials Processing"

2183640, WS 18/19, 3 SWS, Open in study portal — **Practical course (P)**

Description
Media:

lecture notes via ILIAS

Learning Content
The laboratory compromises 8 half-day experiments, which address the following laser processing topics of metals, ceramics and polymers:

• safety aspects

• surface hardening and remelting

• melt and reactive cutting

• surface modification by dispersing or alloying

• welding

• surface texturing

• metrology

There are used CO2-, excimer-, Nd:YAG- and high power diode-laser sources within the laboratory.

Annotation
The maximum number of students is 12 per semester.

Workload
regular attendance: 34 hours
self-study: 86 hours

Literature
W.T. Silfvast: Laser Fundamentals, 2008, Cambrigde University Press

W.M. Steen: Laser Materials Processing, 2010, Springer

V Laboratory "Laser Materials Processing"

2183640, SS 2019, 3 SWS, Open in study portal

Practical course (P)

Description
Media:

lecture notes via ILIAS

Learning Content
The laboratory compromises 8 half-day experiments, which address the following laser processing topics of metals, ceramics and polymers:

• safety aspects

• surface hardening and remelting

• melt and reactive cutting

• surface modification by dispersing or alloying

• welding

• surface texturing

• metrology

There are used CO2-, excimer-, Nd:YAG- and high power diode-laser sources within the laboratory.

Annotation
The maximum number of students is 12 per semester.

Workload
regular attendance: 34 hours
self-study: 86 hours

Literature
W.T. Silfvast: Laser Fundamentals, 2008, Cambrigde University Press

W.M. Steen: Laser Materials Processing, 2010, Springer

T 7.205 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 7.206 Course: Laboratory Work Water Chemistry [T-CIWVT-103351]

Responsible: Dr. Gudrun Abbt-Braun
Prof. Dr. Harald Horn

Organisation: KIT Department of Chemical and Process Engineering

Part of: M-CIWVT-101121 - Wasserchemie und Wassertechnologie I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung anderer Art	4	1

Events					
WS 18/19	22664	Praktikum Wassertechnologie und Wasserbeurteilung	2 SWS	Practical course (P)	Horn, Abbt-Braun, und Mitarbeiter

Prerequisites
none

T 7.207 Course: Large-scale Optimization [T-WIWI-106549]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Events					
SS 2019	2550475	Large-Scale Optimization	2 SWS	Lecture (V)	Rebennack
SS 2019	2550476	Übung zu Large-Scale Optimization	1 SWS	Practice (Ü)	Rebennack
Exams					
WS 18/19	7900155	Large-scale 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 7.208 Course: Laser in Automotive Engineering [T-MACH-105164]

Responsible: Dr.-Ing. Johannes Schneider
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2182642	Laser in automotive engineering	2 SWS	Lecture (V)	Schneider
Exams					
WS 18/19	76-T-MACH-105164	Laser in Automotive Engineering		Prüfung (PR)	Schneider
SS 2019	76-T-MACH-105164	Laser in Automotive Engineering		Prüfung (PR)	Schneider

Competence Certificate
oral examination (30 min)

no tools or reference materials

Prerequisites
It is not possible, to combine this brick with brick Physical Basics of Laser Technology [T-MACH-109084] and brick Physical Basics of Laser Technology [T-MACH-102102]

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102102 - Physical Basics of Laser Technology must not have been started.

Recommendation
preliminary knowlegde in mathematics, physics and materials science

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

V Laser in automotive engineering

2182642, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:

lecture notes via ILIAS

Learning Content
Based on a short description of the physical basics of laser technology the lecture reviews the most important high power lasers and their various applications in automotive engineering. Furthermore the application of laser light in metrology and safety aspects will be addressed.

- physical basics of laser technology
- laser beam sources (Nd:YAG-, CO2-, high power diode-laser)
- beam properties, guiding and shaping
- basics of materials processing with lasers
- laser applications in automotive engineering
- economical aspects
- savety aspects

Annotation
It is allowed to select only one of the lectures "Laser in automotive engineering" (2182642) or "Physical basics of laser technology" (2181612) during the Bachelor and Master studies.

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
W. M. Steen: Laser Material Processing, 2010, Springer

W. T. Silfvast: Laser Fundamentals, 2008, Cambridge University Press

T 7.209 Course: Laser Physics [T-ETIT-100741]

Responsible: Prof. Dr.-Ing. Christian Koos
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101292 - Mikrooptik
M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	4	1

Events					
WS 18/19	2301480	Laserphysics	2 SWS	Lecture (V)	Eichhorn
WS 18/19	2301481	Laserphysics (Tutorial)	1 SWS	Practice (Ü)	Eichhorn
Exams					
WS 18/19	7301480	Laser Physics		Prüfung (PR)	Eichhorn

Prerequisites
none

T 7.210 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-INFO-101242 - Governance, Risk & Compliance
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 7.211 Course: Laws concerning Traffic and Roads [T-BGU-106615]

Responsible: Dr. Dietmar Hönig
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101066 - Sicherheit, EDV und Recht im Straßenwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	6233803	Verkehrs-, Planungs- und Wegerecht	2 SWS	Lecture (V)	Hönig
Exams					
WS 18/19	8240106615	Laws concerning Traffic and Roads		Prüfung (PR)	Roos, Hönig

Competence Certificate
written exam, 60 min.

Prerequisites
None

Recommendation
None

Annotation
None

T 7.212 Course: Lean Construction [T-BGU-108000]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	6241901	Lean Construction	4 SWS	Lecture / Practice (VÜ)	Haghsheno, Mitarbeiter/innen
Exams					
WS 18/19	8246108000	Lean Construction		Prüfung (PR)	Haghsheno

Competence Certificate
written exam, 70 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.213 Course: Learning Factory “Global Production“ [T-MACH-105783]

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

Part of: M-MACH-101282 - Globale Produktion und Logistik
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 7.214 Course: Liberalised Power Markets [T-WIWI-107043]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-102808 - Digital Service Systems in Industry
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2581998	Liberalised Power Markets	2 SWS	Lecture (V)	Fichtner
Exams					
WS 18/19	7900193	Liberalised Power Markets		Prüfung (PR)	Fichtner

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

Prerequisites
See German version.

Recommendation
None

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

V Liberalised Power Markets

2581998, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. The European liberalisation process
1.1 The concept of a competitive market
1.2 The regulated market
1.3 Deregulation in Europe
2. Pricing and investments in a liberalised power market
2.1 Merit order
2.2 Prices and investments
2.3 Market flaws and market failure
2.4 Regulation in liberalised markets
2.5 Additional regulation mechanisms
3. The power market and the corresponding submarkets
3.1 List of submarkets
3.2 Types of submarkets
3.3 Market rules
4. Risk management
4.1 Uncertainties in a liberalised market
4.2 Investment decisions under uncertainty
4.3 Estimating future electricity prices
4.4 Portfolio management
5. Market power
5.1 Defining market power
5.2 Indicators of market power
5.3 Reducing market power
6. Market structures in the value chain of the power sector

Annotation
The course "Basics of Liberalised Energy Markets" [2581998] will be reduced to 3 credits in winter term 2015/2016 and the tutorial [2581999] is no longer offered.

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

Literature
Elective literature:

Power System Economics; Steven Stoft, IEEE Press/Wiley-Interscience Press, 0-471-15040-1

T 7.215 Course: Life Cycle Assessment [T-WIWI-103133]

Responsible: Dr. Heiko Keller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2581995	Life Cycle Assessment	2 SWS	Lecture (V)	Keller
Exams					
WS 18/19	7981995	Life Cycle Assessment		Prüfung (PR)	Schultmann

Competence Certificate
The assessment consists of an oral exam (30 min.) or a written exam (60 min.).

Prerequisites
None.

Recommendation
None

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

V Life Cycle Assessment

2581995, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Our society has reached a historically unique material prosperity. At the same time, environmental burdens and resource consumption are continuously reaching new peaks - not only regarding greenhouse gas emissions and oil production rates. It is obvious that the material and energy intensity of products and services has to decrease if we want to keep our current level of material prosperity on the long run. Enormous efficiency gains, as they have been reached e.g. for labour productivity, however, require that environmental burdens and resource consumption per unit of product are in the first place known, transparent and can thus be optimised. This data and its calculation are increasingly requested and sooner or later will have to become as essential for management as e.g. unit labour costs.

Life cycle assessment is a methodology in sustainability assessment that provides this information and deduces optimisation potentials and decision support for companies, politics, consumers etc. To this end, material and energy flows are compiled along the whole life cycle of a product from extraction of raw materials, via production and use of a product until its disposal. Subsequently, environmental impacts of these flows are analysed.

This lecture describes structure and individual steps of life cycle assessments in detail. Furthermore, it explains its application in decision support. In interactive phases, participants recapitulate the theoretical basis by own calculations. As an outlook, further instruments in sustainability assessment are introduced that analyse other sustainability aspects.

Workload
Total effort required will account for approximately 105h (3.5 credits).

Literature
will be announced in the course

T 7.216 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-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
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 7.217 Course: Long-Distance and Air Traffic [T-BGU-106301]

Responsible: Bastian Chlond
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each term	1

Events					
WS 18/19	6232904	Fern- und Luftverkehr	2 SWS	Lecture (V)	Chlond, Dozenten
Exams					
WS 18/19	8245106301	Long-distance and Air Traffic		Prüfung (PR)	Chlond

Competence Certificate
written exam, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.218 Course: Machine Learning 1 - Basic Methods [T-WIWI-106340]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511500	Machine Learning 1 - Fundamental Methods	2 SWS	Lecture (V)	Zöllner
WS 18/19	2511501	Exercises for Machine Learning 1 - Fundamental Methods	1 SWS	Practice (Ü)	Zöllner
Exams					
WS 18/19	7900076	Machine Learning 1 - Basic Methods		Prüfung (PR)	Zöllner
SS 2019	7900154	Machine Learning 1 - Basic Methods		Prüfung (PR)	Zöllner

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None.

Annotation
New course starting winter term 2017/2018.

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

V Machine Learning 1 - Fundamental Methods

2511500, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
The field of knowledge acquisition and machine learning is a rapidly expanding field of knowledge and the subject of numerous research and development projects. The acquisition of knowledge can take place in different ways. Thus a system can benefit from experiences already made, it can be trained, or it draws conclusions from extensive background knowledge.

The lecture covers symbolic learning methods such as inductive learning (learning from examples, learning by observation), deductive learning (explanation-based learning) and learning from analogies, as well as sub-symbolic techniques such as neural networks, support vector machines and genetic algorithms. The lecture introduces the basic principles and structures of learning systems and examines the algorithms developed so far. The structure and operation of learning systems is presented and explained with some examples, especially from the fields of robotics and image processing.

Learning Content
The field of knowledge acquisition and machine learning is a rapidly expanding field of knowledge and the subject of numerous research and development projects. The acquisition of knowledge can take place in different ways. Thus a system can benefit from experiences already made, it can be trained, or it draws conclusions from extensive background knowledge.

The lecture covers symbolic learning methods such as inductive learning (learning from examples, learning by observation), deductive learning (explanation-based learning) and learning from analogies, as well as sub-symbolic techniques such as neural networks, support vector machines and genetic algorithms. The lecture introduces the basic principles and structures of learning systems and examines the algorithms developed so far. The structure and operation of learning systems is presented and explained with some examples, especially from the fields of robotics and image processing.

Literature
The slides are available as a PDF

Related Literature

- Artificial Intelligence: A Modern Approach - Peter Norvig and Stuart J. Russell
- Machine Learning - Tom Mitchell
- Pattern Recognition and Machine Learning - Christopher M. Bishop
- Reinforcement Learning: An Introduction - Richard S. Sutton and Andrew G. Barto
- Deep Learning - Ian Goodfellow, Yoshua Bengio, Aaron Courville

Further (specific) literature on individual topics will be given in the lecture.

T 7.219 Course: Machine Learning 2 – Advanced Methods [T-WIWI-106341]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-101637 - Analytics und Statistik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2511502	Machine Learning 2 - Advanced methods	2 SWS	Lecture (V)	Zöllner
SS 2019	2511503	Exercises for Machine Learning 2 - Advanced Methods	1 SWS	Practice (Ü)	Zöllner
Exams					
WS 18/19	7900050	Machine Learning 2 – Advanced Methods		Prüfung (PR)	Zöllner
SS 2019	7900080	Machine Learning 2 – Advanced Methods		Prüfung (PR)	Zöllner

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None.

Annotation
New course starting summer term 2017.

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

V Machine Learning 2 - Advanced methods

2511502, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
The field of machine decision-making and inference procedures, taking into account uncertainties and incomplete knowledge, is a rapidly expanding field of knowledge and the subject of numerous research and development projects.

The focus of this lecture is on the embedding and application of machine-learning methods in decision and inference systems starting with methods of dimension reduction, feature selection/evaluation via semi-supervised learning to methods of probabilistic inference (e.g. Dempster Shafer information fusion, dynamic and object-oriented Bayesian networks, POMDP, etc).

The lecture introduces the basic principles and structures and explains algorithms developed so far. The structure and operation of the procedures and methods are presented and explained using a number of application scenarios, in particular from the field of technical (semi-)autonomous systems.

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

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

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

Literature
The slides are available as a PDF

Related Literature

- Artificial Intelligence: A Modern Approach - Peter Norvig and Stuart J. Russell
- Machine Learning - Tom Mitchell
- Pattern Recognition and Machine Learning - Christopher M. Bishop
- Reinforcement Learning: An Introduction - Richard S. Sutton and Andrew G. Barto
- Deep Learning - Ian Goodfellow, Yoshua Bengio, Aaron Courville

Further (specific) literature on individual topics will be given in the lecture.

T 7.220 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 7.221 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 in combination with a project that runs for several weeks during the 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 7.222 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 in combination with a project that runs for several weeks during the 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 7.223 Course: Management of IT-Projects [T-WIWI-102667]

Responsible: Dr. Roland Schätzle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	2511214	Management of IT-Projects	2 SWS	Lecture (V)	Schätzle
SS 2019	2511215	Übungen zu Management von Informatik-Projekten	1 SWS	Practice (Ü)	Schätzle
Exams					
WS 18/19	7900014	Management of IT-Projects		Prüfung (PR)	Oberweis
SS 2019	7900045	Management of IT-Projects		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min) in the first week after lecture period according to Section 4(2), 1 of the examination regulation.

Prerequisites
None.

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

V Management of IT-Projects

2511214, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The lecture deals with the general framework, impact factors and methods for planning, handling, and controlling of IT projects. Especially following topics are addressed:

- project environment
- project organisation
- project planning including the following items:
  - plan of the project structure
  - flow chart
  - project schedule
  - plan of resources
- effort estimation
- project infrastructur
- project controlling
- risk management
- feasibility studies
- decision processes, conduct of negotiations, time management.

Workload
Lecture 30h
Exercise 15h

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

Total: 150h

Literature

- B. Hindel, K. Hörmann, M. Müller, J. Schmied. Basiswissen Software-Projektmanagement. dpunkt.verlag 2004
- Project Management Institute Standards Committee. A Guide to the Project Management Body of Knowledge (PMBoK guide). Project Management Institute. Four Campus Boulevard. Newton Square. PA 190733299. U.S.A.

Further literature is given in each lecture individually.

T 7.224 Course: Management of Water Resources and River Basins [T-BGU-106597]

Responsible: Dr.-Ing. Uwe Ehret
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	6	Each summer term	1

Events					
SS 2019	6224801	Management of Water Resources and River Basins	4 SWS	Lecture / Practice (VÜ)	Ehret

Competence Certificate
course associated assignments, short reports appr. 2 pages each, and
final take home exam, report appr. 10 pages and colloquium

Prerequisites
none

Recommendation
none

Annotation
none

T 7.225 Course: Managing New Technologies [T-WIWI-102612]

Responsible: Dr. Thomas Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	2545003	Managing New Technologies	2 SWS	Lecture (V)	Reiß
Exams					
WS 18/19	7900189	Managing New Technologies		Prüfung (PR)	Reiß

Competence Certificate
Written exam 100% following §4, Abs. 2.

Prerequisites
None

Recommendation
None

Annotation
The credit points for T-WIWI-102612 "Management of New Technologies" were reduced to 3 credit points in the 2019 summer semester.

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

V Managing New Technologies
2545003, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The course provides an overview of the international development of a selected number of key technologies such as biotechnology, nanotechnology, neurotechnologies, converging technologies. Methods for monitoring new technologies including foresight approaches will be presented and the economic and social impacts of new technologies will be discussed.

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

Literature

- Hausschildt/Salomo: Innovationsmanagement; Borchert et al.: Innovations- und Technologiemanagement;
- Specht/Möhrle; Gabler Lexikon Technologiemanagement

T 7.226 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

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 7.227 Course: Market Engineering: Information in Institutions [T-WIWI-102640]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101409 - Electronic Markets
M-WIWI-101411 - Information Engineering
M-WIWI-101446 - Market Engineering
M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-102754 - Service Economics and Management
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540460	Market Engineering: Information in Institutions	2 SWS	Lecture (V)	Weinhardt, Straub
SS 2019	2540461	Übungen zu Market Engineering: Information in Institutions	1 SWS	Practice (Ü)	Weinhardt
Exams					
WS 18/19	7900208	Market Engineering: Information in Institutions		Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) up to 6 bonus points can be obtained. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by max. one grade level (0.3 or 0.4).

Prerequisites
None

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

V Market Engineering: Information in Institutions

2540460, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Description
The ongoing advancements in information technology have revolutionized traditional business processes and given rise to electronic marketplaces. In contrast to physical marketplaces, electronic markets do not just evolve, but must be carefully designed, implemented and monitored and evaluated. Moreover electronic markets demand open and flexible platforms as well as adequate standards and information services. Future Market Engineers must therefore be able to consider the economic, legal and technological dimension of markets simultaneously. The lecture focuses on the discussion of (1) Microstructure, (2) IT Infrastructure, and (3) Business Structure of electronic markets. Hence, students will be taught the economic incentives that a market can impose on market participants, development models for implementing markets, and business models for the application of markets.

Learning Content
The ongoing advancements in information technology have revolutionized traditional business processes and given rise to electronic marketplaces. In contrast to physical marketplaces, electronic markets do not just evolve, but must be carefully designed, implemented and monitored and evaluated. Moreover electronic markets demand open and flexible platforms as well as adequate standards and information services. Future Market Engineers must therefore be able to consider the economic, legal and technological dimension of markets simultaneously. The lecture focuses on the discussion of (1) Microstructure, (2) IT Infrastructure, and (3) Business Structure of electronic markets. Hence, students will be taught the economic incentives that a market can impose on market participants, development models for implementing markets, and business models for the application of markets.

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

Literature

- Roth, A., The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics. Econometrica 70(4): 1341-1378, 2002.
- Weinhardt, C. ,Holtmann, C., Neumann, D., Market Engineering. Wirtschaftsinformatik, 2003.
- Wolfstetter, E., Topics in Microeconomics - Industrial Organization, Auctions, and Incentives. Cambridge, Cambridge University Press, 1999.
- Smith, V. "Theory, Experiments and Economics", The Journal of Economic Perspectives,Vol. 3, No. 1, 151-69 1989

T 7.228 Course: Market Research [T-WIWI-107720]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-101490 - Marketing Management
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-101647 - Data Science: Evidence-based Marketing
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2571150	Market Research	2 SWS	Lecture (V)	Klarmann
SS 2019	2571151	Market Research Tutorial	1 SWS	Practice (Ü)	Honold

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

Prerequisites
None

Recommendation
None

Annotation
Please note that this course has to be completed successfully by students interested in master thesis positions at the Marketing & Sales Research Group.

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

V Market Research
2571150, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Within the lecture, essential statistical methods for measuring customer attitudes (e.g. satisfaction measurement), understanding customer behavior and making strategic decisions will be discussed. The practical use as well as the correct handling of different survey methods will be taught, such as experiments and surveys. To analyze the collected data, various analysis methods are presented, including hypothesis tests, factor analyses, cluster analyses, variance and regression analyses. Building on this, the interpretation of the results will be discussed.

Topics addressed in this course are for example:

- Theoretical foundations of market research
- Statistical foundations of market research
- Measuring customer attitudes
- Understanding customer reactions
- Strategical decision making

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

Workload
The total workload for this course is approximately 135.0 hours.

Presence time: 30 hours

Preparation and wrap-up of the course: 45.0 hours

Exam and exam preparation: 60.0 hours

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

T 7.229 Course: Marketing Analytics [T-WIWI-103139]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101647 - Data Science: Evidence-based Marketing
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
WS 18/19	2572170	Marketing Analytics	2 SWS	Lecture (V)	Klarmann
WS 18/19	2572171	Übung zu Marketing Analytics	1 SWS	Practice (Ü)	Halbauer
Exams					
WS 18/19	7900082	Marketing Analytics		Prüfung (PR)	Klarmann
WS 18/19	7900127	Marketing Analytics		Prüfung (PR)	Klarmann

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

Prerequisites
The prerequisite for taking the course is the successful completion of the course Market Research [2571150].

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-107720 - Market Research must have been passed.

Recommendation
It is strongly recommended to complete the course Market Research prior to taking the Marketing Analytics course.

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

Exchange students can bypass the requirement of passing Market Research if they can prove that they possess sufficient statistical knowledge based on courses attended at their home institution. This will be examined individually by the Marketing & Sales Research Group.

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

V Marketing Analytics

2572170, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
In this course various relevant market research questions are addressed, as for example measuring and understanding customer attitudes, preparing strategic decisions and sales forecasting. In order to analyze these questions, students learn to handle social media data, panel data, nested observations and experimental design. To analyze the data, advanced methods, as for example multilevel modeling, structural equation modeling and return on marketing models are taught. Also, problems of causality are addressed in-depth. The lecture is accompanied by a computer-based exercise, in the course of which the methods are applied practically.

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

Exchange students can bypass the requirement of passing Market Research if they can prove that they possess sufficient statistical knowledge based on courses attended at their home institution. This will be examined individually by the Marketing & Sales Research Group.

Workload
Total workload for 4.5 ECTS: ca. 135 hours

Literature

- Hanssens, Dominique M., Parsons, Leonard J., Schultz, Randall L. (2003), Market response models: Econometric and time series analysis, 2nd ed, Boston.
- Gelman, Andrew, Hill, Jennifer (2006), Data analysis using regression and multilevel/hierarchical models, New York.
- Cameron, A. Colin, Trivedi, Pravin K. (2005), Microeconometrics: methods and applications, New York.
- Chapman, Christopher, Feit, Elea M. (2015), R for Marketing Research and Analytics, Cham.
- Ledolter, Johannes (2013), Data mining and business analytics with R, New York.

T 7.230 Course: Marketing Strategy Business Game [T-WIWI-102835]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101490 - Marketing Management
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2571183	Marketing Strategy Business Game	1 SWS	Block (B)	Klarmann, Assistenten
Exams					
SS 2019	7900022	Marketing Strategy Business Game		Prüfung (PR)	Klarmann

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of a group presentation and a subsequent round of questions totalling 20 minutes.

Prerequisites
None

Recommendation
None

Annotation
Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.

Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

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

V Marketing Strategy Business Game

2571183, SS 2019, 1 SWS, Open in study portal **Block (B)**

Learning Content
Using Markstrat, a marketing strategy business game, students work in groups representing a company that competes on a simulated market against the other groups' companies.

Annotation

- Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop. Exception: In summer term 2016 exceptionally two courses can be chosen or, in case one course has already been chosen previously, a second course can be chosen.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1.5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.
- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in summer term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in summer term starts.

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

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

T 7.231 Course: Master Thesis [T-WIWI-103142]

Responsible: Studiendekan der KIT-Fakultät für Informatik
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101650 - Modul Masterarbeit

Type	Credits	Version
Abschlussarbeit	30	1

Competence Certificate
see module description

Prerequisites
see module description

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

Submission deadline	6 months
Maximum extension period	3 months
Correction period	8 weeks

This thesis requires confirmation by the examination office.

T 7.232 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-101263 - Einführung in die Logistik
M-MACH-101277 - Materialfluss in Logistiksystemen
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 7.233 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 7.234 Course: Mathematical Models and Methods for Production Systems [T-MACH-105189]

Responsible: Prof. Dr.-Ing. Kai Furmans
Marion Rimmele

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101278 - Materialfluss in vernetzten Logistiksystemen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	6	Each winter term	1

Events					
WS 18/19	2117059	Mathematical models and methods for Production Systems	4 SWS	Lecture (V)	Stoll, Rimmele, Furmans
Exams					
WS 18/19	76-T-MACH-105189	Mathematical models and methods for Production Systems		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 Mathematical models and methods for Production Systems

2117059, WS 18/19, 4 SWS, Open in study portal — **Lecture (V)**

Description
Media:
black board, lecture notes, presentations

Notes
lecture language: english

Learning Content

- single server systems: M/M/1, M/G/1: priority rules, model of failures
- networks: open and closed approximations, exact solutions and approximations
- application to flexible manufacturing systems, AGV (automated guided vehicles) - systems
- modeling of control approaches like constant work in process (ConWIP) or kanban
- discrete-time modeling of queuing systems

Workload
regular attendance: 42 hours
self-study: 198 hours

Literature
Wolff: Stochastic Modeling and the Theory of Queues, Prentice Hall, 1989
Shanthikumar, Buzacott: Stochastic Models of Manufacturing Systems

T 7.235 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 7.236 Course: Methods and Models in Transportation Planning [T-BGU-101797]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6232701	Berechnungsverfahren und Modelle in der Verkehrsplanung	2 SWS	Lecture / Practice (VÜ)	Vortisch, Mitarbeiter/innen
Exams					
WS 18/19	8240101797	Methods and Models in Transportation Planning		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.237 Course: Methods in Economic Dynamics [T-WIWI-102906]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101514 - Innovationsökonomik
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	1,5	Each summer term	2

Events					
SS 2019	2560240	Methods in Economic Dynamics	SWS	Lecture (V)	Ott, Bälz

Competence Certificate
Non exam assessment according to § 4 paragraph 3 of the examination regulation (SPO 2015).

Prerequisites
None

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

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

V Methods in Economic Dynamics

2560240, SS 2019, SWS, Open in study portal **Lecture (V)**

Learning Content
The workshop offers the possibility to deepen the understanding about different aspects of theoretical modelling of innovation-based growth and induced economic effects. This includes the implementation of formal models in computer algebra systems as well as recording, processing and econometric analysis of related data from relational databases (concerning for example patents or trademarks). Moreover, methods of network theory are discussed.

Annotation
The course has been added summer 2015.

Workload
The total workload for this course is approximately 45 hours.

Lecture: 15h
Preparation of lecture/exam: 30h

T 7.238 Course: Microactuators [T-MACH-101910]

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

Part of:
M-ETIT-101158 - Sensorik I
M-ETIT-101159 - Sensorik II
M-MACH-101287 - Mikrosystemtechnik
M-MACH-101290 - BioMEMS
M-MACH-101292 - Mikrooptik
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 7.239 Course: Mixed Integer Programming I [T-WIWI-102719]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Exams				
WS 18/19	7900215_WS1819	Mixed Integer Programming I	Prüfung (PR)	Stein

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

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

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of*Mixed Integer Programming II*[25140]. In this case, the duration of the written examination takes 120 minutes.

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102733 - Mixed Integer Programming I and II must not have been started.

Recommendation
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Annotation
The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).

T 7.240 Course: Mixed Integer Programming II [T-WIWI-102720]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Exams				
WS 18/19	7900150_NK_WS1819	Mixed Integer Programming 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.

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

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

The examination can also be combined with the examination of*Mixed Integer Programming I*[2550138]. In this case, the duration of the written examination takes 120 minutes.

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102733 - Mixed Integer Programming I and II must not have been started.

Recommendation
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Annotation
The lecture is offered irregularly. The curriculum of the next three years is available online (kop.ior.kit.edu).

T 7.241 Course: Mobile Machines [T-MACH-105168]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101267 - Mobile Arbeitsmaschinen

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	9	Each summer term	1

Events					
SS 2019	2114073	Mobile Machines	4 SWS	Lecture (V)	Geimer, Geiger
Exams					
WS 18/19	76T-MACH-105168	Mobile Machines		Prüfung (PR)	Geimer
SS 2019	76T-MACH-105168	Mobile Machines		Prüfung (PR)	Geimer
SS 2019	76-T-MACH-105168	Mobile Machines		Prüfung (PR)	Geimer

Competence Certificate
The assessment consists of an oral exam (45 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
none

Recommendation
Knowledge in Fluid Power Systems is required. It is recommended to attend the course *Fluid Power Systems* [2114093] beforehand.

Annotation
After completion of the course the students have knowledge of:

- a wide range of mobile machines
- operation modes and working cycles of importmant mobile machines
- selected subsystems and components

Content:

- Introduction of the required components and machines
- Basics and structure of mobile machines
- Practical insight in the development techniques

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

V Mobile Machines

2114073, SS 2019, 4 SWS, Open in study portal **Lecture (V)**

Description
Media:
Lecture notes.

Learning Content

- Introduction of the required components and machines
- Basics of the structure of the whole system
- Practical insight in the development techniques

Workload

- regular attendance: 42 hours
- self-study: 184 hours

T 7.242 Course: Mobility Services and new Forms of Mobility [T-BGU-103425]

Responsible: Dr.-Ing. Martin Kagerbauer
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6232811	Mobilitätsservices und neue Formen der Mobilität	2 SWS	Lecture / Practice (VÜ)	Kagerbauer
Exams					
WS 18/19	8240103425	Mobility Services and new Forms of Mobility		Prüfung (PR)	Kagerbauer

Prerequisites
None

Recommendation
None

Annotation
None

T 7.243 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 7.244 Course: Modeling and Analyzing Consumer Behavior with R [T-WIWI-102899]

Responsible: Dr. Verena Dorner
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101448 - Service Management
M-WIWI-101489 - Strategie, Kommunikation und Datenanalyse
M-WIWI-101506 - Service Analytics
M-WIWI-103118 - Data Science: Data-Driven User Modeling
M-WIWI-104900 - Betriebswirtschaftslehre

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

Events					
SS 2019	2540470	Modeling and Analyzing Consumer Behavior with R	2 SWS	Lecture (V)	Dorner, Knierim
SS 2019	2540471	Übung zu Modeling and Analyzing Consumer Behaviour with R	1 SWS	Practice (Ü)	Knierim, Greif-Winzrieth

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

Recommendation
None

Annotation
Number of participants limited.

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

V Modeling and Analyzing Consumer Behavior with R

2540470, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Students learn the fundamental methods, algorithms and concepts for analysing consumer data. The students deepen their knowledge in working on a case study and computer exercises, especially in the areas of e-commerce and behavioural economics. In addition, students learn to write applications in R and to organize and execute larger data mining and general data analytics projects. Furthermore, students learn methods for evaluating and visualizing data.

The event will focus on the following topics:

1. basic programming concepts in R
2. data mining with R using established process models such as CRISP-DM
3. text mining and analysis of online data with R
4. working on a case study from the area of Consumer and User Analytics
5. data visualization and evaluation with R

Annotation
The course has been added summer term 2015.

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

Literature
Field, A., Miles, J., Field, Z., Discovering Statistics Using R, SAGE 2014

Jones, O., Maillardet, R., Robinson, A., Scientific Programming and Simulation Using R, Chapmann & Hall / CRC Press 2009

Venables, W.N., Smith, D.M. and the R Core Team, "An Introduction to R", 2012 (Version 2.15.2), http://cran.r-project.org/doc/manuals/R-intro.pdf

Wickham, Hadley, ggplot2: Elegant Graphics for Data Analysis (Use R!), Springer 2009 (2nd edition)

T 7.245 Course: Modeling and OR-Software: Advanced Topics [T-WIWI-106200]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102808 - Digital Service Systems in Industry
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-104899 - Operations Research

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

Events					
WS 18/19	2550490	Modellieren und OR-Software: Fortgeschrittene Themen	3 SWS	Practical course (P)	Nickel, Reuter-Oppermann
Exams					
WS 18/19	00019	Modeling and OR-Software: Advanced Topics		Prüfung (PR)	Nickel

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

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

Prerequisites
None.

Recommendation
Basic knowledge as conveyed in the module*Introduction toOperations Research*is assumed.

Successful completion of the courseModeling and OR-Software: Introduction.

Annotation
Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

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

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

V Modellieren und OR-Software: Fortgeschrittene Themen

2550490, WS 18/19, 3 SWS, Open in study portal — **Practical course (P)**

Learning Content
After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL will be discussed which can be used to solve OR problems on a computer-aided basis.

Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

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 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.

T 7.246 Course: Modeling Strategic Decision Making [T-WIWI-102803]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104900 - Betriebswirtschaftslehre

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

Competence Certificate
The course will not be offered anymore from winter term 2016/2017 on. The examination will be offered latest until summer term 2017 (repeaters only).
Written exam 100% following §4, Abs. 2.

Prerequisites
None

Recommendation
None

T 7.247 Course: Modelling, Measuring and Managing of Extreme Risks [T-WIWI-102841]

Responsible: Prof. Dr. Ute Werner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	2,5	Each summer term	1

Competence Certificate
Non exam assessment (following §4(2), 3 of the examination regulation).

T-WIWI-102841 Modelling, Measuring and Managing of Extreme Risks will be offered latest until summer term 2017 (beginners only).

Prerequisites
None

Recommendation
None

T 7.248 Course: Morphodynamics [T-BGU-101859]

Responsible: Prof. Dr. Franz Nestmann
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-WIWI-101642 - Naturgefahren und Risikomanagement 1
M-WIWI-101644 - Naturgefahren und Risikomanagement 2
M-WIWI-104837 - Naturgefahren und Risikomanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	3	1

Events					
SS 2019	6222805	Morphodynamics	2 SWS	Lecture / Practice (VÜ)	Nestmann

Competence Certificate
See German version.

Prerequisites
None

T 7.249 Course: Multivariate Statistical Methods [T-WIWI-103124]

Responsible: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-101637 - Analytics und Statistik
M-WIWI-101639 - Ökonometrie und Statistik II
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

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

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation. A bonus program can improve the grade by one grade level (i.e. by 0.3 or 0.4).

The exam is offered every semester. Re-examinations are offered only for repeaters.

Prerequisites
None

Recommendation
The course covers highly advanced statistical methods with a quantitative focus. Hence, participants are necessarily expected to have advanced statistical knowledge, e.g. acquired in the course "Advanced Statistics". Without this, participation in the course is not advised.

Previous attendance of the course Analysis of Multivariate Data is recommended. Alternatively, the script can be provided to interested students.

T 7.250 Course: Nanotechnology for Engineers and Natural Scientists [T-MACH-105180]

Responsible: Prof. Dr. Martin Dienwiebel
PD Dr. Hendrik Hölscher
Stefan Walheim

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101294 - Nanotechnologie
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	1

Events					
SS 2019	2142861	Nanotechnology for Engineers and Natural Scientists	2 SWS	Lecture (V)	Hölscher, Dienwiebel, Walheim

Competence Certificate
written exam 90 min

Prerequisites
none

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

V Nanotechnology for Engineers and Natural Scientists

2142861, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
1) Introduction into nanotechnology
2) History of scanning probe techniques
3) Scanning tunneling microscopy (STM)
4) Atomic force microscopy (AFM)
5) Dynamic Modes (DFM, ncAFM, MFM, KPFM, ...)
6) Friction force microscopy & nanotribology
7) Nanolithography
8) Other families of the SPM family

Workload
lectures 30 h

self study 30 h

preparation for examination 30 h

Literature

1. Lecture notes, slides, script
2. Scanning Probe Microscopy – Lab on a Tip: Meyer, Hug, Bennewitz, Springer (2003)

T 7.251 Course: Nanotechnology with Clusterbeams [T-MACH-102080]

Responsible: Dr. Jürgen Gspann
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101287 - Mikrosystemtechnik
M-MACH-101294 - Nanotechnologie
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 7.252 Course: Nanotribology and -Mechanics [T-MACH-102167]

Responsible: Prof. Dr. Martin Dienwiebel
PD Dr. Hendrik Hölscher

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-MACH-101294 - Nanotechnologie
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	4

Events					
WS 18/19	2182712	Nanotribology and -Mechanics	2 SWS	Block lecture (BV)	Dienwiebel
SS 2019	2182712	Nanotribology and -Mechanics	2 SWS	Lecture / Practice (VÜ)	Dienwiebel
Exams					
WS 18/19	76-T-MACH-102167	Nanotribology and -Mechanics		Prüfung (PR)	Dienwiebel

Competence Certificate
presentation (40%) and colloquium (30 min, 60%)

no tools or reference materials

Prerequisites
none

Recommendation
preliminary knowlegde in mathematics and physics

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

V Nanotribology and -Mechanics

2182712, WS 18/19, 2 SWS, Open in study portal — **Block lecture (BV)**

Learning Content
Part 1: Basics:

- Nanotechnology
- Forces at nanometer scale
- contact mechanics models (Hertz, JKR, DMT)
- Experimental methods (SFA, QCM, FFM)
- Prandtl-Tomlinson model
- Superlubricity
- Atomic-Scale Wear

Part 2: Topical papers

Workload
regular attendance: 22,5 hours
preparation for presentation: 22,5 hours
self-study: 75 hours

Literature
Lecture notes, slides and copies of articles

V

Nanotribology and -Mechanics

2182712, SS 2019, 2 SWS, Open in study portal

Lecture / Practice (VÜ)

Learning Content
Part 1: Basics:

- Nanotechnology
- Forces at nanometer scale
- contact mechanics models (Hertz, JKR, DMT)
- Experimental methods (SFA, QCM, FFM)
- Prandtl-Tomlinson model
- Superlubricity
- Atomic-Scale Wear

Part 2: Topical papers

Workload
regular attendance: 22,5 hours
preparation for presentation: 22,5 hours
self-study: 75 hours

Literature
Edward L. Wolf
Nanophysics and Nanotechnology, Wiley-VCH, 2006

C. Mathew Mate
Tribology on the Small Scale: A Bottom Up Approach to Friction, Lubrication, and Wear (Mesoscopic Physics and Nanotechnology) 1st Edition, Oxford University Press

Lecture notes, slides and copies of articles

T 7.253 Course: Nature-Inspired Optimisation Methods [T-WIWI-102679]

Responsible: Dr. rer. nat. Pradyumn Kumar Shukla
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2511106	Nature-Inspired Optimization Methods	2 SWS	Lecture (V)	Shukla
SS 2019	2511107	Übungen zu Nature-Inspired Optimization Methods	1 SWS	Practice (Ü)	Shukla
Exams					
WS 18/19	7900016	Nature-Inspired Optimisation Methods		Prüfung (PR)	Shukla
SS 2019	7900026	Nature-Inspired Optimisation Methods		Prüfung (PR)	Shukla

Competence Certificate
The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation) and an additional written examination called “bonus exam”, 60 min (according Section 4(2), 3 of the examination regulation) or a selection of exersices . The bonus exam may be split into several shorter written tests.

The grade of this course is the achieved grade in the written examination. If this grade is at least 4.0 and at most 1.3, a passed bonus exam will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

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

V Nature-Inspired Optimization Methods

2511106, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Many optimization problems are too complex to be solved to optimality. A promising alternative is to use stochastic heuristics, based on some fundamental principles observed in nature. Examples include evolutionary algorithms, ant algorithms, or simulated annealing. These methods are widely applicable and have proven very powerful in practice. During the course, such optimization methods based on natural principles are presented, analyzed and compared. Since the algorithms are usually quite computational intensive, possibilities for parallelization are also investigated.

T 7.254 Course: Non- and Semiparametrics [T-WIWI-103126]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101638 - Ökonometrie und Statistik I
M-WIWI-101639 - Ökonometrie und Statistik II
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 *"Applied Econometrics"* [2520020]

Annotation
The course takes place every second winter semester: 2018/19 then 2020/21

T 7.255 Course: Nonlinear Optimization I [T-WIWI-102724]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.256 Course: Nonlinear Optimization I and II [T-WIWI-103637]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.257 Course: Nonlinear Optimization II [T-WIWI-102725]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
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 7.258 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-MACH-101294 - Nanotechnologie
M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
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 7.259 Course: Operation Methods for Earthmoving [T-BGU-101801]

Responsible: Dr.-Ing. Heinrich Schlick
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	6241905	Erdbau	1 SWS	Lecture (V)	Haghsheno, Schlick
Exams					
WS 18/19	8240101801	Operation Methods for Earthmoving		Prüfung (PR)	Schneider

Prerequisites
None

Recommendation
None

Annotation
None

T 7.260 Course: Operation Methods for Foundation and Marine Construction [T-BGU-101832]

Responsible: Dr.-Ing. Harald Schneider
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

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

Events					
WS 18/19	6241904	Tiefbau	1 SWS	Lecture (V)	Haghsheno, Schneider
Exams					
WS 18/19	8240101832	Operation Methods for Foundation and Marine Construction		Prüfung (PR)	Schneider

Prerequisites
None

Recommendation
None

Annotation
None

T 7.261 Course: Operations Research in Health Care Management [T-WIWI-102884]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102805 - Service Operations
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	2

Exams				
WS 18/19	7900124	Operations Research in Health Care Management	Prüfung (PR)	Nickel

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

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

Prerequisites
None

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

Annotation
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

T 7.262 Course: Operations Research in Supply Chain Management [T-WIWI-102715]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-102805 - Service Operations
M-WIWI-102832 - Operations Research im Supply Chain Management
M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	2

Events					
SS 2019	2550480	Operations Research in Supply Chain Management	2 SWS	Lecture (V)	Nickel
SS 2019	2550481	Übungen zu OR in Supply Chain Management	1 SWS	Practice (Ü)	Dunke

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

The examination is held in the term of the lecture and the following lecture.

Prerequisites
None

Recommendation
Basic knowledge as conveyed in the module Introduction to Operations Research and in the lectures Facility Location and Strategic SCM,Tactical and operational SCMis assumed.

Annotation
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

Below you will find excerpts from events related to this course:

V Operations Research in Supply Chain Management

2550480, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Supply Chain Management constitutes a general tool for logistics process planning in supply networks. To an increasing degree quantitative decision support is provided by methods and models from Operations Research. The lecture "OR in Supply Chain Management" conveys concepts and approaches for solving practical problems and presents an insight to current research topics. The lecture's focus is set on modeling and solution methods for applications originating in different domains of a supply chain. The emphasis is put on mathematical methods like mixed integer programming, valid inequalities or column generation, and the derivation of optimal solution strategies.

In form and content, the lecture addresses all levels of Supply Chain Management: After a short introduction, the tactical and operational level will be discussed with regard to inventory models, scheduling as well as cutting and packing. The strategic level will be discussed in terms of layout planning. Another main focus of the lecture is the application of methods from online optimization. This optimization discipline has gained more and more importance in the optimization of supply chains over the several past years due to an increasing amount of dynamic data flows.

Annotation
The course is offered irregularly. Planned lectures for the next three years can be found in the internet at http://dol.ior.kit.edu/english/Courses.php.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Simchi-Levi, D.; Chen, X.; Bramel, J.: The Logic of Logistics: Theory, Algorithms, and Applications for Logistics and Supply Chain Management, 2nd edition, Springer, 2005
- Simchi-Levi, D.; Kaminsky, P.; Simchi-Levi, E.: Designing and Managing the Supply Chain: Concepts, Strategies, and Case Studies, McGraw-Hill, 2000
- Silver, E. A.; Pyke, D. F.; Peterson, R.: Inventory Management and Production Planning and Scheduling, 3rd edition, Wiley, 1998
- Blazewicz, J.: Handbook on Scheduling - From Theory to Applications, Springer, 2007
- Pinedo, M. L.: Scheduling - Theory, Algorithms, and Systems (3rd edition), Springer, 2008
- Dyckhoff, H.; Finke, U.: Cutting and Packing in Production and Distribution - A Typology and Bibliography, Physica-Verlag, 1992
- Borodin, A.; El-Yaniv, R.: Online Computation and Competitive Analysis, Cambridge University Press, 2005
- Francis, R. L.; McGinnis, L. F.; White, A.: Facility Layout and Location: An Analytical Approach, 2nd edition, Prentice-Hall, 1992

T 7.263 Course: Optical Transmitters and Receivers [T-ETIT-100639]

Responsible: Prof. Dr. Wolfgang Freude
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2309460	Optical Transmitters and Receivers	2 SWS	Lecture (V)	Freude
WS 18/19	2309461	Optical Transmitters and Receivers (Tutorial)	1 SWS	Practice (Ü)	Freude
Exams					
WS 18/19	7309460	Optical Transmitters and Receivers		Prüfung (PR)	Freude

Prerequisites
none

T 7.264 Course: Optical Waveguides and Fibers [T-ETIT-101945]

Responsible: Prof. Dr.-Ing. Christian Koos
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101292 - Mikrooptik
M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2309464	Optical Waveguides and Fibers	2 SWS	Lecture (V)	Koos
WS 18/19	2309465	Optical Waveguides and Fibers (Tutorial)	1 SWS	Practice (Ü)	Koos
Exams					
WS 18/19	7309464	Optical Waveguides and Fibers		Prüfung (PR)	Koos

Prerequisites
none

T 7.265 Course: Optimization under Uncertainty [T-WIWI-106545]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103289 - Stochastische Optimierung
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 7.266 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

Prerequisites
none

T 7.267 Course: P&C Insurance Simulation Game [T-WIWI-102797]

Responsible: Prof. Dr. Ute Werner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	1

Competence Certificate
T-WIWI-102797 P+C Insurance Simulation Game will not be offered anymore from winter term 2016/2017 on.

Prerequisites
None

Recommendation
See German version.

T 7.268 Course: Panel Data [T-WIWI-103127]

Responsible: Dr. Wolf-Dieter Heller
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101638 - Ökonometrie und Statistik I
M-WIWI-101639 - Ökonometrie und Statistik II
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2520320	Paneldaten	2 SWS	Lecture (V)	Heller
SS 2019	2520321	Übungen zu Paneldaten	2 SWS	Practice (Ü)	Heller

Prerequisites
None

T 7.269 Course: Parametric Optimization [T-WIWI-102855]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101473 - Mathematische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Exams				
WS 18/19	7900141_HK_WS1819	Parametric Optimization	Prüfung (PR)	Stein

Competence Certificate
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.

Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.

Prerequisites
None

Recommendation
It is strongly recommended to visit at least one lecture from the Bachelor program of this chair before attending this course.

Annotation
The lecture is offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

T 7.270 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 7.271 Course: Personalization and Services [T-WIWI-102848]

Responsible: Dr.-Ing. Andreas Sonnenbichler
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2540533	Personalization & Services	2 SWS	Lecture (V)	Sonnenbichler
WS 18/19	2540534	Exercise Personalization & Services	1 SWS	Practice (Ü)	Sonnenbichler
Exams					
WS 18/19	7979702	Personalization and Services		Prüfung (PR)	Geyer-Schulz

Competence Certificate
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Personalization & Services

2540533, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content

- Personalization of Services and Applications
- User Modeling
- User Profiles
- Authentification
- Authorization
- Applications in e-Commerce and for internet-based Services
- Personalized Web Search
- Privacy

Workload
The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

Sum: 135h 00m

Literature
The course follows latest scientific papers. References to these papers are listed at the end of each course unit.

T 7.272 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 7.273 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 7.274 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 7.275 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 7.276 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 7.277 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 7.278 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 7.279 Course: Photovoltaic System Design [T-ETIT-100724]

Responsible: Robin Grab
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101164 - Erzeugung und Übertragung regenerativer Energie
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung schriftlich	3	1

Events					
SS 2019	2307380	Photovoltaische Systemtechnik	2 SWS	Lecture (V)	Grab
Exams					
SS 2019	7307380	Photovoltaics		Prüfung (PR)	Leibfried

Prerequisites
none

T 7.280 Course: Physical Basics of Laser Technology [T-MACH-102102]

Responsible: Dr.-Ing. Johannes Schneider
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	5	Each winter term	3

Events					
WS 18/19	2181612	Physical basics of laser technology	3 SWS	Lecture / Practice (VÜ)	Schneider
Exams					
WS 18/19	76-T-MACH-102102	Physical Basics of Laser Technology		Prüfung (PR)	Schneider
SS 2019	76-T-MACH-102102	Physical Basics of Laser Technology		Prüfung (PR)	Schneider

Competence Certificate
oral examination (30 min)

no tools or reference materials

Prerequisites
It is not possible, to combine this brick with brick Laser Application in Automotive Engineering [T-MACH-105164] and brick Physical Basics of Laser Technology [T-MACH-109084]

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-105164 - Laser in Automotive Engineering must not have been started.

Recommendation
Basic knowledge of physics, chemistry and material science

Below you will find excerpts from events related to this course:

V Physical basics of laser technology
2181612, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Description
Media:
lecture notes via ILIAS

Learning Content
Based on the description of the physical basics about the formation and the properties of laser light the lecture goes through the different types of laser beam sources used in industry these days. The lecture focuses on the usage of lasers especially in materials engineering. Other areas like measurement technology or medical applications are also mentioned. An excursion to the laser laboratory of the Institute for Applied Materials (IAM) will be offered.

- physical basics of laser technology
- laser beam sources (solid state, diode, gas, liquid and other lasers)
- beam properties, guiding and shaping
- lasers in materials processing
- lasers in measurement technology
- lasers for medical applications
- savety aspects

The lecture is complemented by a tutorial.

Annotation
It is allowed to select only one of the lectures "Laser in automotive engineering" (2182642) or "Physical basics of laser technology" (2181612) during the Bachelor and Master studies.

Workload
regular attendance: 33,5 hours
self-study: 146,5 hours

Literature
W. T. Silfvast: Laser Fundamentals, 2008, Cambridge University Press

W. M. Steen: Laser Material Processing, 2010, Springer

T 7.281 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-MACH-101291 - Mikrofertigung
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 7.282 Course: Planning and Management of Industrial Plants [T-WIWI-102631]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5,5	Each winter term	1

Events					
WS 18/19	2581952	Planning and Management of Industrial Plants	2 SWS	Lecture (V)	Glöser-Chahoud
WS 18/19	2581953	Übungen Anlagenwirtschaft	2 SWS	Practice (Ü)	Schiel, Rosenberg
Exams					
WS 18/19	7981952	Planning and Management of Industrial Plants		Prüfung (PR)	Schultmann

Competence Certificate
The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Planning and Management of Industrial Plants

2581952, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Industrial plant management incorporates a complex set of tasks along the entire life cycle of an industrial plant, starting with the initiation and erection up to operating and dismantling.
During this course students will get to know special characteristics of industrial plant management. Students will learn important methods to plan, realize and supervise the supply, start-up, maintenance, optimisation and shut-down of industrial plants. Alongside, students will have to handle the inherent question of choosing between technologies and evaluating each of them. This course pays special attention to the specific characteristics of plant engineering, commissioning and investment.

Workload
Total effort required will account for approximately 165h (5.5 credits).

Literature
will be announced in the course

T 7.283 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-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
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 7.284 Course: PLM-CAD Workshop [T-MACH-102153]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
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 7.285 Course: Polymer Engineering I [T-MACH-102137]

Responsible: Prof. Dr.-Ing. Peter Elsner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2173590	Polymer Engineering I	2 SWS	Lecture (V)	Elsner, Weidenmann
Exams					
WS 18/19	76-T-MACH-102137	Polymer Engineering I		Prüfung (PR)	Elsner
SS 2019	76-T-MACH-102137	Polymer Engineering I		Prüfung (PR)	Elsner

Competence Certificate
Oral exam, about 25 minutes

Prerequisites
none

Below you will find excerpts from events related to this course:

V Polymer Engineering I

2173590, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Economical aspects of polymers
2. Introductiom of mechanical,
chemical end electrical properties
3. Processing of polymers
(introduction)
4. Material science of polymers
5. Synthesis

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Recommended literature and selected official lecture notes are provided in the lecture

T 7.286 Course: Polymer Engineering II [T-MACH-102138]

Responsible: Prof. Dr.-Ing. Peter Elsner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2174596	Polymer Engineering II	2 SWS	Lecture (V)	Elsner
Exams					
WS 18/19	76-T-MACH-102138	Polymerengineering II		Prüfung (PR)	Elsner
SS 2019	76-T-MACH-102138	Polymerengineering II		Prüfung (PR)	Elsner

Competence Certificate
Oral exam, about 25 minutes

Prerequisites
none

Recommendation
Knowledge in Polymerengineering I

Below you will find excerpts from events related to this course:

V Polymer Engineering II

2174596, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Processing of polymers
2. Properties of polymer components
Based on practical examples and components
2.1 Selection of material
2.2 Component design
2.3 Tool engineering
2.4 Production technology
2.5 Surface engineering
2.6 Sustainability, recycling

Workload
The workload for the lecture Polymerengineering II is 120 h per semester and consists of the presence during the lecture (21 h) as well as preparation and rework time at home (99 h).

Literature
Recommended literature and selected official lecture notes are provided in the lecture.

T 7.287 Course: Polymers in MEMS A: Chemistry, Synthesis and Applications [T-MACH-102192]

Responsible: Dr.-Ing. Bastian Rapp
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	2141853	Polymers in MEMS A: Chemistry, Synthesis and Applications	2 SWS	Block lecture (BV)	Rapp

Competence Certificate
Oral examination

Prerequisites
none

Below you will find excerpts from events related to this course:

V Polymers in MEMS A: Chemistry, Synthesis and Applications

2141853, WS 18/19, 2 SWS, Open in study portal **Block lecture (BV)**

Description
Media:
The lecture slides will be given out as scriptum during each lecture course.

Learning Content
We all come in contact with numerous polymeric products in everyday life. From water bottles to packaging to the cover of the iPad, many things are made of polymers. Polymers are also important materials for modern microelectromechanical systems (MEMS) allowing cost effective mass market compatible products, e.g., in the life sciences or diagnostics. But polymers are not just cost-effective replacements for more expensive classical materials in MEMS (such as, e.g., silicon) – some polymers have intrinsic properties that make them ideal materials for sensors, actuators or templates for biology and chemistry in MEMS.

This lecture will introduce the basics of organic chemistry required for understanding what polymers are, how they are manufactured and which mechanisms are responsible for their unique properties. The lecture will highlight (in the context of MEMS but also in a wider scope) where and why polymers are applied with a strong focus on their chemical and physical properties (and on their synthesis).

Some of the topics covered are:

- What is the basic chemistry of polymers? What are monomers, what are macromolecules and how are they formed?
- How are polymers produced on industrial scale – but also on the laboratory scale? Numerous examples of how to make (commonly and lesser known) polymers will be discussed including materials such as Plexiglas.
- Why are polymers so important for biochemistry and tissue engineering?
- How do photoresists work and why do some polymers contract when exposed to light?
- What are high-performance polymers and why do they have such a wide application range, e.g., in implants?
- What polymers fuel the household 3D printing community and what materials do 3D printers such as, e.g., the RepRap work with?
- How does 3D printing and rapid prototyping work and which polymers can be employed for which techniques?
- Why does silicone always smell like vinegar and why is this material so important for modern day microfluidics? How do you built fluid-logic devices using silicone?
- How do shape memory polymers remember their shape?
- What are polymer foams and why are they not only important for heat insulation but also for organic chemistry?
- How do glues work? Why are there two-component glues, what is superglue and how can you make glue from potatoes?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu). Preregistration is not necessary.

The examination will be held in oral form at the end of the lecture. The lecture can be chosen as "Nebenfach" or part of a "Hauptfach". The second lecture of the lecture series "Polymers in MEMS B – Physics, manufacturing and applications" (which is also held in winter semester) can be combined with this lecture as part of a "Hauptfach". In summer semester, the third part of the lecture series "Polymers in MEMS C – Biopolymers, Biopolymers and applications" will be given which may be combined with lectures A and B to form a complete "Hauptfach".

Annotation
For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu). Preregistration is not necessary.

Workload

- lecture: 15 * 1.5 h (22 h)
- lecture preparation (before and after lecture): 15 * 2 h (30 h)
- preparation of final exam: 70 h

T 7.288 Course: Polymers in MEMS B: Physics, Microstructuring and Applications [T-MACH-102191]

Responsible: Dr.Ing. Matthias Worgull
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	2141854	Polymers in MEMS B: Physics, Microstructuring and Applications	2 SWS	Lecture (V)	Worgull
Exams					
WS 18/19	76-T-MACH-102191	Polymers in MEMS B: Physics, Microstructuring and Applications		Prüfung (PR)	Worgull
SS 2019	76-T-MACH-102191	Polymers in MEMS B: Physics, Microstructuring and Applications		Prüfung (PR)	Worgull

Competence Certificate
Oral examination

Prerequisites
none

Below you will find excerpts from events related to this course:

V Polymers in MEMS B: Physics, Microstructuring and Applications

2141854, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:
The lecture slides will be given out as scriptum during each lecture course.

Learning Content
We all come in contact with numerous polymeric products in everyday life. From water bottles to packaging to the cover of the iPad, many things are made of polymers. Polymers are also important materials for modern microelectromechanical systems (MEMS) allowing cost effective mass market compatible products, e.g., in the life sciences or diagnostics. But polymers are not just cost-effective replacements for more expensive classical materials in MEMS (such as, e.g., silicon) – some polymers have intrinsic properties that make them ideal materials for sensors, actuators or templates for biology and chemistry in MEMS.
This lecture will introduce the basics of physics and material science required for the understanding of the mechanical behavior seen from the engineers view. Micro and nanostructuring of polymers allows the fabrication of micro parts fulfilling their tasks in mostly invisible different applications. But also the fabrication of polymer parts with functional surfaces inspired from Bionics will be presented in this lesson. The lesson will give further an overview over the polymer based structuring processes and will underline the importance by a number of applications e.g. photonic structures or Lotus-like structures.

Some of the topics covered are:

- How can polymers described from the view of engineers?
- What are the differences between polymers and metals?
- Rheology of polymer melts – How does polymer melts flow?
- How can polymers be formed and demolded?
- Which structuring processes (replication) processes are available?
- How does stress influence molded parts (e.g. the deformation of a CD in a hot car)
- Shrinkage of polymers – which precision is achievable
- Gluing or welding – How can polymers be assembled?
- Simulation of replication processes
- Characterization of polymers – which properties can be measured?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

The examination will be held in oral form at the end of the lecture. The lecture can be chosen as "Nebenfach" or part of a "Hauptfach". The second lecture of the lecture series ""Polymers in MEMS A – Chemistry, synthesis and applications " (which is also held in winter semester) can be combined with this lecture as part of a "Hauptfach". In summer semester, the third part of the lecture series "Polymers in MEMS C – Biopolymers, Biopolymers and applications" will be given which may be combined with lectures A and B to form a complete "Hauptfach".

Annotation
For further details, please contact the lecturer, PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

Workload

- lecture: 15 * 1.5 h (22 h)
- lecture preparation (before and after lecture): 15 * 2 h (30 h)
- preparation of final exam: 70 h

T 7.289 Course: Polymers in MEMS C: Biopolymers and Bioplastics [T-MACH-102200]

Responsible: Dr.-Ing. Bastian Rapp
Dr.Ing. Matthias Worgull

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2142855	Polymers in MEMS C - Biopolymers and Bioplastics	2 SWS	Block lecture (BV)	Worgull, Rapp
Exams					
WS 18/19	76-T-MACH-102200	Polymers in MEMS C: Biopolymers and Bioplastics		Prüfung (PR)	Worgull, Rapp

Competence Certificate
Oral examination

Prerequisites
none

Below you will find excerpts from events related to this course:

V Polymers in MEMS C - Biopolymers and Bioplastics

2142855, SS 2019, 2 SWS, Open in study portal

Block lecture (BV)

Learning Content
Polymers are ubiquitous in everyday life: from packaging materials all the way to specialty products in medicine and medical engineering. Today it is difficult to find a product which does not (at least in parts) consist of polymeric materials. The question of how these materials can be improved with respect to their disposal and consumption of (natural) resources during manufacturing is often raised. Today polymers must be fully recycled in Germany and many other countries due to the fact that they do not (or only very slowly) decompose in nature. Furthermore significant reductions of crude oil consumption during synthesis are of increasing importance in order to improve the sustainability of this class of materials. With respect to disposal polymers which do not have to be disposed by combustion but rather allow natural decomposition (composting) are of increasing interest. Polymers from renewable sources are also of interest for modern microelectromechanical systems (MEMS) especially if the systems designed are intended as single-use products.

This lecture will introduce the most important classes of these so-called biopolymers and bioplastics. It will also discuss and highlight polymers which are created from naturally created analogues (e.g. via fermentation) to petrochemical polymer precursors and describe their technical processing. Numerous examples from MEMS as well as everyday life will be given.

Some of the topics covered are:

- What are biopolyurethanes and how can you produce them from castor oil?
- What are "natural glues" and how are they different from chemical glues?
- How do you make tires from natural rubbers?
- What are the two most important polymers for life on earth?
- How can you make polymers from potatoes?
- Can wood be formed by injection molding?
- How do you make buttons from milk?
- Can you play music on biopolymers?
- Where and how do you use polymers for tissue engineering?
- How can you built LEGO with DNA?

The lecture will be given in German language unless non-German speaking students attend. In this case, the lecture will be given in English (with some German translations of technical vocabulary). The lecture slides are in English language and will be handed out for taking notes. Additional literature is not required.

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu) and PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

Annotation
For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu) and PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is not necessary.

Workload

- lecture: 15 * 1.5 h (22 h)
- lecture preparation (before and after lecture): 15 * 2 h (30 h)

preparation of final exam: 70 h

Literature
Additional literature is not required.

T 7.290 Course: Portfolio and Asset Liability Management [T-WIWI-103128]

Responsible: Dr. Mher Safarian
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101639 - Ökonometrie und Statistik II
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2520357	Portfolio and Asset Liability Management	2 SWS	Lecture (V)	Safarian
SS 2019	2520358	Übungen zu Portfolio and Asset Liability Management	2 SWS	Practice (Ü)	Safarian

Competence Certificate
The assessment of this course consists of a written examination (following §4(2), 1 SPOs, 180 min.) and of possible additional assignments during the course (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Prerequisites
None

Below you will find excerpts from events related to this course:

V Portfolio and Asset Liability Management

2520357, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Description
Portfolio theory: principles of investment, Markowitz- portfolio analysis, Modigliani-Miller theorems and absence of arbitrage, efficient markets, capital asset pricing model (CAPM), multi factorial CAPM, arbitragepricing theory (APT), arbitrage and hedging, multi factorial models, equity-portfolio management, passive strategies, active investment

Asset liability: statistical portfolio analysis in stock allocation, measures of success, dynamic multi seasonal models, models in building scenarios, stochastic programming in bond and liability management, optimal investment strategies, integrated asset liability management

Learning Content
Portfolio theory: principles of investment, Markowitz- portfolio analysis, Modigliani-Miller theorems and absence of arbitrage, efficient markets, capital asset pricing model (CAPM), multi factorial CAPM, arbitragepricing theory (APT), arbitrage and hedging, multi factorial models, equity-portfolio management, passive strategies, active investment

Asset liability: statistical portfolio analysis in stock allocation, measures of success, dynamic multi seasonal models, models in building scenarios, stochastic programming in bond and liability management, optimal investment strategies, integrated asset liability management

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.

Elective literature:

To be announced in lecture.

T 7.291 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-101164 - Erzeugung und Übertragung regenerativer Energie
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 7.292 Course: Power Transmission and Power Network Control [T-ETIT-101941]

Responsible: Prof. Dr.-Ing. Thomas Leibfried
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101164 - Erzeugung und Übertragung regenerativer Energie
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	1

Events					
SS 2019	2307372	Power Transmission and Power Network Control	2 SWS	Lecture (V)	Leibfried
SS 2019	2307374	Übungen zu 2307372 Energieübertragung und Netzregelung	1 SWS	Practice (Ü)	Nowak
Exams					
WS 18/19	7307372	Power Transmission and Power Network Control		Prüfung (PR)	Leibfried
SS 2019	7307372	Power Transmission and Power Network Control		Prüfung (PR)	Leibfried

Prerequisites
none

T 7.293 Course: Practical Course Polymers in MEMS [T-MACH-105556]

Responsible: Dr.-Ing. Bastian Rapp
Dr.Ing. Matthias Worgull

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	3	Each summer term	1

Events					
SS 2019	2142856	Practical Course Polymers in MEMS	2 SWS	Block (B)	Worgull, Rapp

Competence Certificate
The practical course will close with an oral examination.There will be only passed and failed results, no grades.

Prerequisites
none

Below you will find excerpts from events related to this course:

V Practical Course Polymers in MEMS

2142856, SS 2019, 2 SWS, Open in study portal **Block (B)**

Description
Media:
descriptions of the experiments

Learning Content
This practical course complements the lectures "Polymers in MEMS A", "Polymers in MEMS B" and "Polymers in MEMS C" and will allow students to gain a deeper understanding of polymers and their processing. During the course of this practical course, various polymers will be synthesized and molded into components suitable for microelectromechanical systems (MEMS) applications. The aim of the course is to bring a polymer all the way from synthesis to application.
The practical course will be given in German language unless non-German speaking students attend. In this case, the course will be given in English (with some German translations of technical vocabulary). Lecture notes for the experiments are in English language and will be handed out to the students. The practical course will be held "en block" at the end of the semester (presumably beginning of October)

For further details, please contact the lecturer, Dr. Ing. Bastian E. Rapp (bastian.rapp@kit.edu) and PD Dr.-Ing. Matthias Worgull (matthias.worgull@kit.edu). Preregistration is mandatory. The number of participants is limited to 5 students.

Workload

- practical course: 3 * 8 h (24 h)
- experiment preparation (before and after lecture): 30 h

preparation of final exam: 66 h

Literature
Scripts of the corresponding lectures, further literature as named there.

T 7.294 Course: Practical Course Technical Ceramics [T-MACH-105178]

Responsible: Dr.-Ing. Rainer Oberacker
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	1	Each winter term	1

Events					
WS 18/19	2125751	Practical Course Technical Ceramics	2 SWS	Practical course (P)	Schell
Exams					
WS 18/19	76-T-MACH-105178	Practical Course Technical Ceramics		Prüfung (PR)	Schell

Competence Certificate
Colloquium and laboratory report for the respective experiments.

Prerequisites
none

Below you will find excerpts from events related to this course:

V Practical Course Technical Ceramics

2125751, WS 18/19, 2 SWS, Open in study portal — **Practical course (P)**

Learning Content
Based on alumina as a model material, major test methods for the characterization of raw materials, intermediate and final products are practically applied. Topics:

- powder caracterization
- Shaping of powder compacts
- sintering
- microstructural characterization
- mechanical testing

On the basis of short descriptions of the methods, the students prepare themselfes, carry out the experiments and write a laboratory report.

Workload
regular attendance: 30 hours
self-study: 90 hours

Literature
Salmang, H.: Keramik, 7. Aufl., Springer Berlin Heidelberg, 2007. - Online-Ressource

Richerson, D. R.: Modern Ceramic Engineering, CRC Taylor & Francis, 2006

T 7.295 Course: Practical Seminar Digital Service Systems [T-WIWI-106563]

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-102808 - Digital Service Systems in Industry
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Irregular	1

Events					
SS 2019	2540554	Practical Seminar: Information Systems & Service Design	3 SWS	Lecture (V)	Mädche
Exams					
WS 18/19	7900279	Practical Seminar Digital Service Systems		Prüfung (PR)	Satzger

Competence Certificate
The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites
None

Recommendation
None

Annotation
New course title starting summer term 2017: "Practical Seminar Digital Service Systems".
The current range of seminar topics is announced on the KSRI website www.ksri.kit.edu.

Below you will find excerpts from events related to this course:

V Practical Seminar: Information Systems & Service Design

2540554, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Description
Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: “The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes.” Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management.** The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

Learning Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

T 7.296 Course: Practical Seminar Service Innovation [T-WIWI-102799]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-102806 - Service Innovation, Design & Engineering
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Irregular	1

Exams				
WS 18/19	7900152	Team Work in the Area of Service Oriented Architectures	Prüfung (PR)	Satzger

Competence Certificate
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted 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
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-105774 - Practical Seminar: Digital Service Design must not have been started.

Recommendation
Knowledge of Service Innovation Methods is assumed. Therefore it is recommended to attend the course Service Innovation [2540468] beforehand.

Annotation
Due to the project work, the number of participants is limited and participation requires knowledge about models, concepts and approaches that are taught in the Service Innovation lecture. Having taken the Service Innovation lecture or demonstrating equivalent knowledge is a prerequisite for participating in this Practical Seminar. Details for registration will be announced on the web pages for this course.

The seminar is not offered regularly.

T 7.297 Course: Practical Seminar: Advanced Analytics [T-WIWI-108765]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103118 - Data Science: Data-Driven User Modeling
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Each term	1

Exams				
WS 18/19	7900275	Practical Seminar: Advanced Analytics	Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of practical work in the field of advanced analytics, a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-106214 - Practical Seminar: Crowd Analytics must not have been started.

Recommendation
At least one module offered by the institute should have been chosen before attending this seminar.

Annotation
The course is held in English. The course is not offered regularly.

T 7.298 Course: Practical Seminar: Data-Driven Information Systems [T-WIWI-106207]

Responsible: Prof. Dr. Alexander Mädche
Prof.Dr. Thomas Setzer
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-103117 - Data Science: Data-Driven Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Each term	1

Competence Certificate
The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites
None

Recommendation
At least one module offered by the institute should have been chosen before attending this seminar.

Annotation
The course is held in english. The course is not offered regularly.

T 7.299 Course: Practical Seminar: Health Care Management (with Case Studies) [T-WIWI-102716]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102805 - Service Operations
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Each term	2

Events					
SS 2019	2550498	Practical seminar: Health Care Management	5 SWS	Event (Veranst.)	Nickel, Reuter-Oppermann
Exams					
WS 18/19	7900105	Practical Seminar: Health Care Management (with Case Studies)		Prüfung (PR)	Nickel

Competence Certificate
The assessment consists in a case study, the writing of a corresponding paper, and an oral exam (according to §4(2), 2 of the examination regulation).

Prerequisites
None.

Recommendation
Basic knowledge as conveyed in the module *Introduction toOperations Research* is assumed.

Annotation
The credits have been reduced to 4,5 starting summer term 2016.
The lecture is offered every term.

The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V Practical seminar: Health Care Management

2550498, SS 2019, 5 SWS, Open in study portal — **Event (Veranst.)**

Learning Content
Processes in a hospital are often grown historically ("We have always done it this way"), so that there has not been the need to analyze processes until reforms of the health system have put increasing pressure on hospitals. Consequently, nowadays hospitals look for possibilities to improve their processes. The students are confronted with case studies and are asked to develop a solution. Therefore they have to collect and analyze relevant data , processes and structures. When developing the solution the students have to bear in mind that besides the economic efficiency also the quality of care and patient satisfaction (e.g. measured in waiting time) may not be neglected in the health care sector.

Annotation
The lecture is offered every term.

The planned lectures and courses for the next three years are announced online.

Workload
The total workload for this course is approximately135 hours. For further information see German version.

Literature
Elective literature:

- Fleßa: Grundzüge der Krankenhausbetriebslehre, Oldenbourg, 2007
- Fleßa: Grundzüge der Krankenhaussteuerung, Oldenbourg, 2008
- Hall: Patient flow: reducing delay in healthcare delivery, Springer, 2006

T 7.300 Course: Practical Seminar: Information Systems and Service Design [T-WIWI-108437]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102806 - Service Innovation, Design & Engineering
M-WIWI-104068 - Information Systems in Organizations
M-WIWI-104080 - Designing Interactive Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4,5	Each term	2

Events					
SS 2019	2540554	Practical Seminar: Information Systems & Service Design	3 SWS	Lecture (V)	Mädche

Competence Certificate
The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

Prerequisites
None.

Recommendation
Attending the course „Digital Service Design“ is recommended, but not mandatory.

Annotation
The course is held in English.

Below you will find excerpts from events related to this course:

V Practical Seminar: Information Systems & Service Design

2540554, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Description
Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: “The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes.” Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management.** The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

Learning Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

T 7.301 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-MACH-101290 - BioMEMS
M-MACH-101291 - Mikrofertigung
M-MACH-101292 - Mikrooptik
M-MACH-101294 - Nanotechnologie
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 7.302 Course: Predictive Mechanism and Market Design [T-WIWI-102862]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen
M-WIWI-101505 - Experimentelle Wirtschaftsforschung
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Annotation
The course is given every second fall term, e.g., WS2017/18, WS2019/20, ...

The retake exam is given in the summer term subsequent to the fall term where the course (lecture and final exam) is given.

T 7.303 Course: Price Management [T-WIWI-105946]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Dr Paul Glenn

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101409 - Electronic Markets
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Exams				
WS 18/19	7900170	Price Management (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
None

Annotation
The lecture is offered for the first time in summer term 2016.

T 7.304 Course: Price Negotiation and Sales Presentations [T-WIWI-102891]

Responsible: Prof. Dr. Martin Klarmann
Mark Schröder

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101487 - Sales Management
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	1,5	Each winter term	3

Events					
WS 18/19	2572198	Price Negotiation and Sales Presentations	1 SWS	Block (B)	Klarmann, Schröder
Exams					
WS 18/19	7900148	Price Negotiation and Sales Presentations		Prüfung (PR)	Klarmann

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015). The assessment consists of a presentation with a subsequent discussion totalling 25 minutes. Moreover learning contents are checked by realistic 30-minute price negotiations.

Prerequisites
None

Recommendation
None

Annotation
Participation requires an application. The application period starts at the beginning of the semester. More information can be obtained on the website of the research group Marketing & Sales (marketing.iism.kit.edu).
Access to this course is restricted. Typically all students will be granted the attendance of one course with 1.5 ECTS. Nevertheless attendance can not be guaranteed.

For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

Please note that only one of the following courses can be attended in the Sales Management module: Country Manager Simulation, Case Studies in Sales and Pricing, Price Negotiation and Sales Presentations or Digital Marketing and Sales in B2B.

Below you will find excerpts from events related to this course:

V Price Negotiation and Sales Presentations

2572198, WS 18/19, 1 SWS, Open in study portal **Block (B)**

Learning Content
At first, theoretical knowledge about the behavior in selling contexts is discussed. Then, in a practical part, students will apply this knowledge in their own price negotiations.

Annotation

- In order to participate in this course, you need to apply. Applications are usually accepted at the start of the lecture period in winter term. Detailed information on the application process is usually provided on the website of the Marketing and Sales Research Group (marketing.iism.kit.edu) shortly before the lecture period in winter term starts.
- Please note that only one of the following courses can be chosen in the Sales Management Module: Country Manager Simulation, Case Studies in Sales and Pricing or Preisverhandlungen und Verkaufspräsentationen.
- Please note: The number of participants for this course is limited. The Marketing and Sales Research Group typically provides the possibility to attend a course with 1,5 ECTS in the respective module to all students. Participation in a specific course cannot be guaranteed.

Workload
The total workload for this course is approximately 45.0 hours. For further information see German version.

Literature
None

T 7.305 Course: Pricing [T-WIWI-102883]

Responsible: Dr. Sven Feurer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-101489 - Strategie, Kommunikation und Datenanalyse
M-WIWI-101490 - Marketing Management
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2572157	Pricing	2 SWS	Lecture (V)	Feurer
WS 18/19	2572169	Übung zu Pricing	1 SWS	Practice (Ü)	Klingemann
Exams					
WS 18/19	7900138	Pricing		Prüfung (PR)	Feurer
WS 18/19	7900286	Pricing		Prüfung (PR)	Feurer

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Pricing

2572157, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
This course addresses central elements and peculiarities of pricing goods and services. The topics are below others:

- Price demand functions
- Concept of the price elasticity of demand
- Key concepts of behavioral pricing
- Decision-making areas in pricing

Annotation
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

T 7.306 Course: Principles of Ceramic and Powder Metallurgy Processing [T-MACH-102111]

Responsible: Dr. Günter Schell
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2193010	Basic principles of powder metallurgical and ceramic processing	2 SWS	Lecture (V)	Schell
Exams					
WS 18/19	76-T-MACH-102111	Principles of Ceramic and Powder Metallurgy Processing		Prüfung (PR)	Schell
SS 2019	76-T-MACH-102111	Principles of Ceramic and Powder Metallurgy Processing		Prüfung (PR)	Schell

Competence Certificate
The assessment consists of an oral exam (20-30 min) taking place at the agreed date. The re-examination is offered upon agreement.

Prerequisites
none

Below you will find excerpts from events related to this course:

V Basic principles of powder metallurgical and ceramic processing

2193010, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The course covers fundamentals of the process technology for shaping of ceramic or metal particle systems. Important shaping methods are reviewed. The focus is on characterization and properties of particulate systems, and, in particular, on process technology for shaping of powders, pastes, and suspensions.

Workload
regular attendance: 25 hours
self-study: 95 hours

Literature

- R.J. Brook: Processing of Ceramics I+II, VCH Weinheim, 1996
- M.N. Rahaman: Cermamic Processing and Sintering, 2nd Ed., Marcel Dekker, 2003
- W. Schatt ; K.-P. Wieters ; B. Kieback. ".Pulvermetallurgie: Technologien und Werkstoffe", Springer, 2007
- R.M. German. "Powder metallurgy and particulate materials processing. Metal Powder Industries Federation, 2005
- F. Thümmler, R. Oberacker. "Introduction to Powder Metallurgy", Institute of Materials, 1993

T 7.307 Course: Principles of Food Process Engineering [T-CIWVT-101874]

Responsible: Dr. Volker Gaukel
Organisation: KIT Department of Chemical and Process Engineering
Part of: M-CIWVT-101120 - Grundlagen Lebensmittelverfahrenstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	9	1

Events					
WS 18/19	22207	Lebensmittelkunde und -funktionalität	2 SWS	Lecture (V)	Watzl
WS 18/19	22213	Verfahrenstechnische Grundlagen am Beispiel der Lebensmittelverarbeitung (für LmCh, WiWi)	2 SWS	Lecture (V)	Gaukel
SS 2019	22214	Vertiefung verfahrenstechnischer Grundlagen am Beispiel Lebensmittel	2 SWS	Lecture (V)	Gaukel
SS 2019	22215	Produktgestaltung: Beispiele aus der Praxis	2 SWS	Lecture (V)	Bröckel, Esper, Hirth, Karbstein, Kind, Müller, Nirschl, Sass, Türk

Prerequisites
none

T 7.308 Course: Principles of Insurance Management [T-WIWI-102603]

Responsible: Prof. Dr. Ute Werner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	Each summer term	1

Competence Certificate
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

The examination will be offered latest until summer term 2017 (beginners only).

Prerequisites
None

Recommendation
None

T 7.309 Course: Process Engineering [T-BGU-101844]

Responsible: Dr.-Ing. Harald Schneider
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6241703	Verfahrenstechnik	2 SWS	Lecture (V)	Schneider, Schlick, Görisch
Exams					
WS 18/19	8240101844	Process Engineering		Prüfung (PR)	Schneider

Prerequisites
None

Recommendation
None

Annotation
None

T 7.310 Course: Process Mining [T-WIWI-109799]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	1

Events					
SS 2019	2511204	Process Mining	2 SWS	Lecture (V)	Oberweis
SS 2019	2511205	Exercise Process Mining	1 SWS	Practice (Ü)	Oberweis, Ullrich
Exams					
SS 2019	7900048	Process Mining		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites
None

Annotation
Former name (up to winter semester 2018/1019) "Workflow Management".

Below you will find excerpts from events related to this course:

V Process Mining
2511204, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The area of process mining covers approaches which aim at deducting new knowledge on the basis of logfiles generated by information systems. Such information systems are e.g., workflow-management-systems which are used for an efficient control of processes in enterprises and organisations. The lecture introduces the foundations of processes and respective modeling and analysis techniques. In the following, the foundations of process mining and the three classical types of approaches - discovery, conformance and enhancement - will be taught. In addition to the theoretical basics, tools, application scenarios in practice and open research questions are covered as well.

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- W. van der Aalst, H. van Kees: Workflow Management: Models, Methods and Systems, Cambridge, The MIT Press, 2002.
- W. van der Aalst: Process Mining: Data Science in Action. Springer, 2016.
- J. Carmona, B. van Dongen, A. Solti, M. Weidlich: Conformance Checking: Relating Processes and Models. Springer, 2018.
- A. Drescher, A. Koschmider, A. Oberweis: Modellierung und Analyse von Geschäftsprozessen: Grundlagen und Übungsaufgaben mit Lösungen. De Gruyter Studium, 2017.
- A. Oberweis: Modellierung und Ausführung von Workflows mit Petri-Netzen. Teubner-Reihe Wirtschaftsinformatik, B.G. Teubner Verlag, 1996.
- R. Peters, M. Nauroth: Process-Mining: Geschäftsprozesse: smart, schnell und einfach, Springer, 2019.
- F. Schönthaler, G.Vossen, A. Oberweis, T. Karle: Business Processes for Business Communities: Modeling Languages, Methods, Tools. Springer, 2012.
- M. Weske: Business Process Management: Concepts, Languages, Architectures. Springer, 2012.

Further literature is given in the lecture.

T 7.311 Course: Product and Innovation Management [T-WIWI-109864]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101490 - Marketing Management
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-101514 - Innovationsökonomik
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	1

Events					
SS 2019	2571154	Product and Innovation Management	2 SWS	Lecture (V)	Klarmann

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-WIWI-102812 - Product and Innovation Management must not have been started.

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 Product and Innovation Management

2571154, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
This course addresses topics around the management of new as well as existing products. After the foundations of product management, especially the product choice behavior of customers, students get to know in detail different steps of the innovation process. Another section regards the management of the existing product portfolio.

Annotation
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Workload
Total effort for 3 credit points: approx. 90 hours

Presence time: 30 hours

Preparation and wrap-up of LV: 45.0 hours

Exam and exam preparation: 15.0 hours

Literature
Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

T 7.312 Course: Production and Logistics Controlling [T-WIWI-103091]

Responsible: Alexander Rausch
Organisation: KIT Department of Economics and Management
Part of: M-MACH-101263 - Einführung in die Logistik
M-MACH-101277 - Materialfluss in Logistiksystemen
M-MACH-101278 - Materialfluss in vernetzten Logistiksystemen
M-MACH-101279 - Technische Logistik
M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
M-MACH-101282 - Globale Produktion und 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 7.313 Course: Production and Logistics Management [T-WIWI-102632]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5,5	Each summer term	1

Events					
SS 2019	2581954	Production and Logistics Management	2 SWS	Lecture (V)	Schultmann
SS 2019	2581955	Übung zu Produktions- und Logistikmanagement	2 SWS	Practice (Ü)	Rudi, Zimmer
Exams					
WS 18/19	7981954	Production and Logistics 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. Reexaminations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Production and Logistics Management

2581954, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
This course covers central tasks and challenges of an operative production and logistics management. Students get to know the set-up and mode of operation of planning systems such as PPS-, ERP- and Advanced Planning Systems to cope with the accompanying planning tasks. Methods to solve these tasks will be explored with respect to manufacturing program planning, material and time. Alongside to MRP II, students will be introduced to integrated supply chain management approaches in PPS. Finally, commercially available PPS-, ERP- and Advanced Planning Systems will be presented and discussed.

Learning Content
This course covers central tasks and challenges of operational production and logistics management. Systems analytically, central planning tasks are discussed. Exemplary solution approaches for these tasks are presented. Further practical approaches are explained. Students get to know the set-up and mode of operation of planning systems such as PPS-, ERP- and Advanced Planning Systems to cope with the accompanying planning tasks. Alongside to MRP II, students will be introduced to integrated supply chain management approaches in Supply Chain Management.

Workload
Total effort required will account for approximately 165h (5.5 credits).

Literature
will be announced in the course

T 7.314 Course: Project Lab Cognitive Automobiles and Robots [T-WIWI-109985]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each winter term	1

Events					
WS 18/19	2512501	Projektpraktikum Kognitive Automobile und Roboter	3 SWS	Practical course (P)	Zöllner

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and
- a written seminar thesis

Details of the grade formation will be announced at the beginning of the course.

Prerequisites
None

T 7.315 Course: Project Lab Machine Learning [T-WIWI-109983]

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each summer term	1

Events					
SS 2019	2512500	Projektpraktikum Maschinelles Lernen	3 SWS	Practical course (P)	Zöllner
Exams					
SS 2019	7900086	Project Lab Machine Learning		Prüfung (PR)	Zöllner

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of:

- a practical work
- a presentation and
- a written seminar thesis

Details of the grade formation will be announced at the beginning of the course.

Prerequisites
None

T 7.316 Course: Project Management [T-WIWI-103134]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	1

Events					
WS 18/19	2581963	Project Management	2 SWS	Lecture (V)	Schultmann, Volk, Wiens, Schiel, Hübner, Schumacher
WS 18/19	2581964	Übung zu Project Management	1 SWS	Practice (Ü)	Volk, Wiens, Hübner, Schumacher, Schiel
Exams					
WS 18/19	7981963	Project Management		Prüfung (PR)	Schultmann

Competence Certificate
The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Project Management

2581963, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content

1. Introduction
2. Principles of Project Management
3. Project Scope Management
4. Time Management and Resource Scheduling
5. Cost Management
6. Quality Management
7. Risk Management
8. Stakeholder
9. Communication, Negotiation and Leadership
10. Project Controlling

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
will be announced in the course

T 7.317 Course: Project Management in Construction and Real Estate Industry I [T-BGU-103432]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6241701	Projektmanagement in der Bau- und Immobilienwirtschaft	4 SWS	Lecture / Practice (VÜ)	Haghsheno, Hirschberger, Sittinger, Münzl
Exams					
WS 18/19	8240103432	Project Management in Construction and Real Estate Industry I		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.318 Course: Project Management in Construction and Real Estate Industry II [T-BGU-103433]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	6241701	Projektmanagement in der Bau- und Immobilienwirtschaft	4 SWS	Lecture / Practice (VÜ)	Haghsheno, Hirschberger, Sittinger, Münzl
Exams					
WS 18/19	8240103433	Project Management in Construction and Real Estate Industry II		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.319 Course: Project Paper Lean Construction [T-BGU-101007]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	1,5	Each winter term	1

Events					
WS 18/19	6241901	Lean Construction	4 SWS	Lecture / Practice (VÜ)	Haghsheno, Mitarbeiter/innen
Exams					
WS 18/19	8246101007	Project paper Lean Construction		Prüfung (PR)	Haghsheno

Competence Certificate
project:
report, appr. 10 pages, and
presentation, appr. 10 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.320 Course: Project Studies [T-BGU-101847]

Responsible: Prof. Dr.-Ing. Sascha Gentes
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6243801	Projektstudien	2 SWS	Lecture / Practice (VÜ)	Haupenthal, Gentes
Exams					
WS 18/19	8240101847	Project Studies		Prüfung (PR)	Gentes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.321 Course: Project Workshop: Automotive Engineering [T-MACH-102156]

Responsible: Dr.-Ing. Michael Frey
Prof. Dr. Frank Gauterin
Dr.-Ing. Martin Gießler

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-MACH-101265 - Fahrzeugentwicklung
M-MACH-101266 - Fahrzeugtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	Each term	1

Events					
WS 18/19	2115817	Project Workshop: Automotive Engineering	3 SWS	Lecture (V)	Gauterin, Gießler, Frey
SS 2019	2115817	Project Workshop: Automotive Engineering	3 SWS	Lecture (V)	Gauterin, Gießler, Frey
Exams					
WS 18/19	76-T-MACH-102156	Project Workshop: Automotive Engineering		Prüfung (PR)	Gauterin

Competence Certificate
Oral examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Below you will find excerpts from events related to this course:

V Project Workshop: Automotive Engineering

2115817, WS 18/19, 3 SWS, Open in study portal — **Lecture (V)**

Notes
Limited number of participants with selection procedure, in German language. Please send the application at the end of the previous semester
Date and room: see homepage of institute.

Learning Content
During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Annotation
Selection procedure, applications are to submit in the end of the preceding semester.

Workload
regular attendance: 49 hours
self-study: 131 hours

Literature
Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

The scripts will be supplied in the start-up meeting.

V **Project Workshop: Automotive Engineering** **Lecture (V)**
2115817, SS 2019, 3 SWS, Open in study portal

Learning Content
During the Project Workshop Automotive Engineering a team of six persons will work on a task given by an German industrial partner using the instruments of project management. The task is relevant for the actual business and the results are intended to be industrialized after the completion of the project workshop.

The team will generate approaches in its own responsibility and will develop solutions for practical application. Coaching will be supplied by both, company and institute.

At the beginning in a start-up meeting goals and structure of the project will be specified. During the project workshop there will be weekly team meetings. Also a milestone meeting will be held together with persons from the industrial company. In a final presentation the project results will be presented to the company management and to institute representatives.

Annotation
Selection procedure, applications are to submit in the end of the preceding semester.

Workload
regular attendance: 49 hours
self-study:131 hours

Literature
Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

The scripts will be supplied in the start-up meeting.

T 7.322 Course: Public Management [T-WIWI-102740]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101504 - Collective Decision Making
M-WIWI-101511 - Vertiefung Finanzwissenschaft
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2561127	Public Management	3 SWS	Lecture / Practice (VÜ)	Wigger
Exams					
WS 18/19	790puma	Public Management		Prüfung (PR)	Wigger
SS 2019	790puma	Public Management		Prüfung (PR)	Wigger

Competence Certificate
The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Prerequisites
None

Recommendation
Basic knowledge of Public Finance is required.

Below you will find excerpts from events related to this course:

V Public Management
2561127, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content
The lecture "Public Management" deals with the economic theory of public sector administration. It is divided into four parts. The first section gives an overview of the legal framework of governmental administration in the Federal Republic of Germany and introduces the classical theory of administration as developed by Weber. Part two studies concepts of public decision-making, which have a significant impact on the operation of public sector administrations and where one focus is on consistency problems of collective decision-making. The third chapter deals with efficiency problems arising in conventionally organized public administrations and companies. X-inefficiency, information and control problems, the isolated consideration of income-spending-relations as well as rent-seeking problems will be considered. In section four the concept of New Public Management, which is a new approach to public sector administration that is mainly based in contract theory, is introduced. Its foundations in institutional economics are developed, with a focus on the specific incentive structures in self-administered administrations. Finally, the achievements of New Public Management approaches are discussed.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Elective literature:

- Damkowski, W. and C. Precht (1995): Public Management; Kohlhammer
- Richter, R. and E.G. Furubotn (2003): Neue Institutionenökonomik; 3rd edition; Mohr
- Schedler, K. and I. Proeller (2003): New Public Management; 2nd edition; UTB
- Mueller, D.C. (2009): Public Choice III; Cambridge University Press
- Wigger, B.U. (2006): Grundzüge der Finanzwissenschaft; 2nd edition; Springer

T 7.323 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 7.324 Course: Public Revenues [T-WIWI-102739]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101511 - Vertiefung Finanzwissenschaft
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 7.325 Course: Quality Management [T-MACH-102107]

Responsible: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101282 - Globale Produktion und Logistik
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 7.326 Course: Quantitative Methods in Energy Economics [T-WIWI-107446]

Responsible: Dr. Dogan Keles
Patrick Plötz

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2581007	Quantitative Methods in Energy Economics	2 SWS	Lecture (V)	Keles, Plötz
WS 18/19	2581008	Übung zu Quantitative Methods in Energy Economics	1 SWS	Practice (Ü)	Plötz
Exams					
WS 18/19	7981007	Quantitative Methods in Energy Economics		Prüfung (PR)	Fichtner

Competence Certificate
The assessment consists of a written exam (following §4(2), 1 of the examination regulation).
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Quantitative Methods in Energy Economics

2581007, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
Energy economics makes use of many quantitative methods in exploration and analysis of data as well as in simulations and modelling. This lecture course aims at introducing students of energy economics into the application of quantitative methods and techniques as taught in elementary courses to real problems in energy economics. The focus is mainly on regression, simulation, time series analysis and related statistical methods as applied in energy economics.

Workload
The total workload for this course is approximately 120 hours. For further information see German version.

T 7.327 Course: Quantum Functional Devices and Semiconductor Technology [T-ETIT-100740]

Responsible: Prof. Dr.-Ing. Christian Koos
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-MACH-101294 - Nanotechnologie
M-MACH-101295 - Optoelektronik und Optische Kommunikationstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	3	1

Events					
SS 2019	2309476	Quantum Functional Devices and Semiconductor Technology	2 SWS	Lecture (V)	Walther
Exams					
WS 18/19	7309476	Quantum Functional Devices and Semiconductor Technology		Prüfung (PR)	Walther

Prerequisites
none

T 7.328 Course: Rail System Technology [T-MACH-102143]

Responsible: Prof. Dr.-Ing. Peter Gratzfeld
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101274 - Bahnsystemtechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	9	Each term	3

Events					
WS 18/19	2115919	Rail System Technology	2 SWS	Lecture (V)	Gratzfeld
WS 18/19	2115996	Rail Vehicle Technology	2 SWS	Lecture (V)	Gratzfeld
SS 2019	2115919	Rail System Technology	2 SWS	Lecture (V)	Gratzfeld
SS 2019	2115996	Rail Vehicle Technology	2 SWS	Lecture (V)	Gratzfeld
Exams					
WS 18/19	76-T-MACH-102143	Rail System Technology		Prüfung (PR)	Gratzfeld
SS 2019	76-T-MACH-102143	Rail System Technology		Prüfung (PR)	Gratzfeld

Competence Certificate
Oral examination

Duration: 45 minutes

No tools or reference materials may be used during the exam.

Prerequisites
none

Below you will find excerpts from events related to this course:

V Rail System Technology

2115919, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Media:

All slides are available for download (Ilias-platform).

Learning Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signalling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, power networks, filling stations
8. History (optional)

Workload
Regular attendance: 21 hours

Self-study: 21 hours

Exam and preparation: 78 hours

Literature
A bibliography is available for download (Ilias-platform).

V Rail Vehicle Technology
2115996, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content

1. System structure of rail vehicles: tasks and classification of rail vehicles, main systems, vehicle system technology
2. Drives: Electric and non-electric traction drives
3. Brakes: Tasks, basics, principles, brake control
4. Bogies: forces, running gears, axle configuration
5. Vehicle concepts: trams, metros, regional trains, high speed trains, double deck coaches, locomotives. Examples of existing rail vehicles were discussed.

Workload
Regular attendance: 21 hours

Self-study: 21 hours

Exam and preparation: 78 hours

Literature
A bibliography is available for download (Ilias-platform).

V Rail System Technology
2115919, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:

All slides are available for download (Ilias-platform).

Learning Content

1. Railway System: railway as system, subsystems and interdependencies, definitions, laws, rules, railway and environment, economic impact
2. Operation: Transportation, public transport, regional transport, long-distance transport, freight service, scheduling
3. Infrastructure: rail facilities, track alignment, railway stations, clearance diagram
4. Wheel-rail-contact: carrying of vehicle mass, adhesion, wheel guidance, current return
5. Vehicle dynamics: tractive and brake effort, driving resistance, inertial force, load cycles
6. Signaling and Control: operating procedure, succession of trains, European Train Control System, blocking period, automatic train control
7. Traction power supply: power supply of rail vehicles, power networks, filling stations
8. History (optional)

Workload
Regular attendance: 21 hours

Self-study: 21 hours

Exam and preparation: 78 hours

Literature
A bibliography is available for download (Ilias-platform).

V Rail Vehicle Technology
2115996, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:

All slides are available for download (Ilias-platform).

Learning Content

1. Vehicle system technology: structure and main systems of rail vehicles
2. Car body: functions, requirements, design principles, crash elements, interfaces
3. Bogies: forces, running gears, axle configuration
4. Drives: vehicle with/without contact wire, dual-mode vehicle
5. Brakes: tasks, basics, principles, blending, brake control
6. Train control management system: definitions, networks, bus systems, components, examples
7. Vehicle concepts: trams, metros, regional trains, intercity trains, high speed trains, double deck coaches, locomotives, freight wagons

Workload

Regular attendance: 21 hours

Self-study: 21 hours

Exam and preparation: 78 hours

Literature

A bibliography is available for download (Ilias-platform).

T 7.329 Course: Real Estate Economics and Sustainability Part 1: Basics and Valuation [T-WIWI-102838]

Responsible: Prof. Dr David Lorenz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101508 - Immobilienwirtschaft und Nachhaltigkeit
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Competence Certificate
The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place.
Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Prerequisites
None

Recommendation
A combination with courses in the area of

- Finance
- Insurance
- Civil engineering and architecture

is recommended.

Particularly recommended is the successful completion of the following Bachelor-Modules:

- Real Estate Management I and II
- Design, Construction and Assessment of Green Buildings I and II

T 7.330 Course: Real Estate Economics and Sustainability Part 2: Reporting and Rating [T-WIWI-102839]

Responsible: Prof. Dr David Lorenz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101508 - Immobilienwirtschaft und Nachhaltigkeit
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Competence Certificate
It is currently unclear whether the course "Real Estate Economics and Sustainability Part 2: Reporting and Rating" can be offered in summer term 2018. It must therefore be expected that the corresponding module M-WIWI-101508 "Real Estate Management and Sustainability" can not be completed according to schedule.

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (Part 1: Basics and Valuation and Part 2: Reporting and Rating) happen in the same semester in which the lectures take place.

Therefore, Part I currently only takes place in the winter semester and Part II takes place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Prerequisites
None

Recommendation
A combination with courses in the area of

- Finance
- Insurance
- Civil engineering and architecture

is recommended.

Particularly recommended is the successful completion of the following Bachelor-Modules:

- Real Estate Management I and II
- Design, Construction and Assessment of Green Buildings I and II

T 7.331 Course: Recommender Systems [T-WIWI-102847]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2540506	Recommender Systems	2 SWS	Lecture (V)	Geyer-Schulz
SS 2019	2540507	Exercise Recommender Systems	1 SWS	Practice (Ü)	Schweizer
Exams					
WS 18/19	7900149	Recommender Systems		Prüfung (PR)	Geyer-Schulz

Competence Certificate
Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.
A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Recommender Systems

2540506, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
At first, an overview of general aspects and concepts of recommender systems and its relevance for service providers and customers is given. Next, different categories of recommender systems are discussed. This includes explicit recommendations like customer reviews as well as implicit services based on behavioral data. Furthermore, the course gives a detailed view of the current research on recommender systems at the Chair of Information Services and Electronic Markets.

Workload
The total workload for this course is approximately 135 hours (4.5 credits):

Time of attendance

- Attending the lecture: 15 x 90min = 22h 30m
- Attending the exercise classes: 7 x 90min = 10h 30m
- Examination: 1h 00m

Self-study

- Preparation and wrap-up of the lecture: 15 x 180min = 45h 00m
- Preparing the exercises: 25h 00m
- Preparation of the examination: 31h 00m

Sum: 135h 00m

Literature

Rakesh Agrawal, Tomasz Imielinski, and Arun Swami. Mining association rules between sets of items in large databases. In Sushil Jajodia Peter Buneman, editor, Proceedings of the ACM SIGMOD International Conference on Management of Data, volume 22, Washington, D.C., USA, Jun 1993. ACM, ACM Press.

Rakesh Agrawal and Ramakrishnan Srikant. Fast algorithms for mining association rules. In Proceedings of the 20th Very Large Databases Conference, Santiago, Chile, pages 487 – 499, Sep 1994.

Asim Ansari, Skander Essegaier, and Rajeev Kohli. Internet recommendation systems. Journal of Marketing Research, 37:363 – 375, Aug 2000.

Christopher Avery, Paul Resnick, and Richard Zweckhauser. The market for evaluations. American Economic Review, 89(3):564 – 584, 1999.

Ibrahim Cingil, Asuman Dogac, and Ayca Azgin. A Broader Approach to Personalization. Communications of the ACM, 43(8):136 – 141, Aug 2000.

Richard O. Duda, Peter E. Hart, and David G. Stork. Pattern Classification. Wiley-Interscience, New York, 2 edition, 2001.

Andreas Geyer-Schulz, Michael Hahsler, and Maximilian Jahn. A customer purchase incidence model applied to recommender services. In R. Kohavi et al., editor, Proceedings of the WebKDD 2001 – Mining log data across all customer touchpoints, volume 2356 of Lecture Notes in Artificial Intelligence LNAI, pages 25–47, Berlin, 2002. ACM, Springer-Verlag.

Jon M. Kleinberg. Authoritative sources in a hyperlinked environment. JACM, 46(5):604–632, sep 1999.

Joseph Konstan, Bradley Miller, David Maltz, Jonathan Herlocker, Lee Gordon, and John Riedl. Grouplens: Applying Collaborative Filtering to Usernet News. Communications of the ACM, 40(3):77 – 87, Mar 1997.

Paul Resnick, Neophytos Iacovou, Peter Bergstrom, and John Riedl. Grouplens: An open architecture for collaborative filtering of netnews. In Proceedings of the conference on Computer supported cooperative work, pages 175 – 186. ACM Press, 1994.

Elective literature:

Antoinette Alexander. The return of hardware: A necessary evil? Accounting Technology, 15(8):46 – 49, Sep 1999.

Christopher Avery and Richard Zeckhauser. Recommender systems for evaluating computer messages. Communications of the ACM, 40(3):88 – 89, Mar 1997.

Steven Bellman, Gerald Lohse, and Eric Johnson. Predictors of Online Buying Behavior. Communications of the ACM, 42(12):32 – 38, Dec 1999.

Thomas J. Blischok. Every transaction tells a story. Chain Store Age Executive with Shopping Center Age, 71(3):50–56, Mar 1995.

Hans Hermann Bock. Automatische Klassifikation. Vandenhoeck und Ruprecht, Göttingen, 1974.

Andrew S.C. Ehrenberg. Repeat-Buying: Facts, Theory and Applications. Charles Griffin & Company Ltd, London, 2 edition, 1988.

Wolfgang Gaul, Andreas Geyer-Schulz, Michael Hahsler, and Lars Schmidt-Thieme. eMarketing mittels Recommendersystemen. Marketing ZFP, 24:47 – 55, 2002.

Andreas Geyer-Schulz, Michael Hahsler, and Maximilian Jahn. myvu: a next generation recommender system based on observed consumer behavior and interactive evolutionary algorithms. In W. Gaul, O. Opitz, and M. Schader, editors, Data Analysis – Scientific Modeling and Practical Applications, volume 18 of Studies in Classification, Data Analysis and Knowledge Organization, pages 447 – 457, Heidelberg, Germany, 2000. Springer.

Andreas Geyer-Schulz, Michael Hahsler, and Maximillian Jahn. Educational and scientific recommender systems: Designing the information channels of the virtual university. International Journal of Engineering Education, 17(2):153 – 163, 2001.

Mark-Edward Grey. Recommendersysteme auf Basis linearer Regression, 2004.

John A. Hartigan. Clustering Algorithms. John Wiley and Sons, New York, 1975.

Kevin Kelly. New Rules for the New Economy: 10 Radical Strategies for a Connected World. Viking, 1998.

Taek-Hun Kim, Young-Suk Ryu, Seok-In Park, and Sung-Bong Yang. An improved recommendation algorithm in collaborative filtering. In K. Bauknecht, A. Min Tjoa, and G. Quirchmayr, editors, E-Commerce and Web Technologies, Third International Conference, Aix-en-Provence, France, volume 2455 of Lecture Notes in Computer Science, pages 254–261, Berlin, Sep 2002. Springer-Verlag.

Ron Kohavi, Brij Masand, Myra Spiliopoulou, and Jaideep Srivastava. Web mining. Data Mining and Knowledge Discovery, 6:5 – 8, 2002.

G. S. Maddala. Introduction to Econometrics. John Wiley, Chichester, 3 edition, 2001.

Andreas Mild and Martin Natter. Collaborative filtering or regression models for Internet recommendation systems? Journal of Targeting, Measurement and Analysis for Marketing, 10(4):304 – 313, Jan 2002.

Andreas Mild and Thomas Reutterer. An improved collaborative filtering approach for predicting cross-category purchases based on binary market basket data. Journal of Retailing & Consumer Services, 10(3):123–133, may 2003.

Paul Resnick and Hal R. Varian. Recommender Systems. Communications of the ACM, 40(3):56 – 58, Mar 1997.

Badrul M. Sarwar, Joseph A. Konstan, Al Borchers, Jon Herlocker, Brad Miller, and John Riedl. Using filtering agents to improve prediction quality in the grouplens research collaborative filtering system. In Proceedings of ACM Conference on Computer-Supported Cooperative Work, Social Filtering, Social Influences, pages 345 – 354, New York, 1998. ACM Press.

J. Ben Schafer, Joseph Konstan, and Jon Riedl. Recommender Systems in E-commerce. In Proceedings of the 1st ACM conference on Electronic commerce, pages 158 – 166, Denver, Colorado, USA, Nov 1999. ACM.

Upendra Shardanand and Patti Maes. Social information filtering: Algorithms for automating "word of mouth". In Proceedings of ACM SIGCHI, volume 1 of Papers: Using the Information of Others, pages 210 – 217. ACM, 1995.

T 7.332 Course: Regulation Theory and Practice [T-WIWI-102712]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101406 - Netzwerkökonomie
M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	see Annotations	2

Exams				
WS 18/19	7900272	Regulation Theory and Practice	Prüfung (PR)	Mitusch

Competence Certificate
The lecture is not offered for an indefinite period of time.

Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Prerequisites
None

Recommendation
Basic knowledge and skills of microeconomics from undergraduate studies (bachelor's degree) are expected.

Particularly helpful but not necessary: Industrial Economics and Principal-Agent- or Contract theories. Prior attendance of the lecture*Competition in Networks* [26240] is helpful in any case but not considered a formal precondition.

Annotation
The lecture is not offered for an indefinite period of time.

T 7.333 Course: Risk Communication [T-WIWI-102649]

Responsible: Prof. Dr. Ute Werner
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101449 - Insurance Management II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4,5	Each winter term	1

Competence Certificate
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (30 min.) according to Section 4 (2), 2 of the examination regulation.

The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Prerequisites
None

Recommendation
None

T 7.334 Course: Risk Management in Industrial Supply Networks [T-WIWI-102826]

Responsible: Dr. Marcus Wiens
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	1

Events					
WS 18/19	2581992	Risk Management in Industrial Supply Networks	2 SWS	Lecture (V)	Wiens
WS 18/19	2581993	Übung zu Risk Management in Industrial Supply Networks	1 SWS	Practice (Ü)	Klein, Wiens
Exams					
WS 18/19	7981992	Risk Management in Industrial Supply Networks		Prüfung (PR)	Schultmann

Competence Certificate
The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following § 4(2), 1 of the examination regulation). The exam takes place in every semester. Reexaminations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Risk Management in Industrial Supply Networks

2581992, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content

- supply chain management: introduction, aims and trends
- industrial risk management
- definition und characterization of risks: sourcing and procurement, demand, production and infrastructure
- identification of risks
- risk controlling
- risk assessment and decision support tools
- risk prevention and mitigation strategies
- robust design of supply chain networks
- supplier selection
- capacity management
- business continuity management

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
will be announced in the course

T 7.335 Course: Roadmapping [T-WIWI-102853]

Responsible: Dr. Daniel Jeffrey Koch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101488 - Entrepreneurship (EnTechnon)
M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	2545102	Roadmapping	2 SWS	Seminar (S)	Koch
Exams					
SS 2019	7900055	Roadmapping		Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
Prior attendance of the course *Innovation Management* [2545015] is recommended.

Annotation
See German version.

Below you will find excerpts from events related to this course:

V Roadmapping
2545102, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
Roadmapping is a method used to support innovation decisions in the early phase of innovation management. The roadmapping process addresses the procedure of constructing roadmaps which can then be assessed. Roadmapping provides structured and graphical visualizations of preferably future-oriented topics which have innovation potentials. The benefits of the roadmapping method lie in the structured bundling of both technology- and market-driven individual topics and the joint setting of priorities and processes to achieve predetermined corporate targets. As a rule, roadmaps represent a consensus reached by the people involved in their compilation. For this reason, roadmaps are suited to the designation and initial prioritization of emerging technologies and corresponding development projects.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

T 7.336 Course: Safety Engineering [T-MACH-105171]

Responsible: Hans-Peter Kany
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101263 - Einführung in die Logistik
M-MACH-101279 - Technische Logistik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	2

Events					
WS 18/19	2117061	Safety Engineering	2 SWS	Lecture (V)	Kany
Exams					
WS 18/19	7600020	Safety Engineering		Prüfung (PR)	Kany
WS 18/19	76-T-MACH-105171	Safety Engineering		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 Safety Engineering

2117061, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations

Learning Content
The course provides basic knowledge of safety engineering. In particular the basics of health at the working place, job safety in Germany, national and European safety rules and the basics of safe machine design are covered. The implementation of these aspects will be illustrated by examples of material handling and storage technology. This course focuses on: basics of safety at work, safety regulations, basic safety principles of machine design, protection devices, system security with risk analysis, electronics in safety engineering, safety engineering for storage and material handling technique, electrical dangers and ergonomics. So, mainly, the technical measures of risk reduction in specific technical circumstances are covered.

Annotation
none

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
Defren/Wickert: Sicherheit für den Maschinen- und Anlagenbau, Druckerei und
Verlag: H. von Ameln, Ratingen, ISBN: 3-926069-06-6

T 7.337 Course: Safety Management in Highway Engineering [T-BGU-101674]

Responsible: Dr.-Ing. Matthias Zimmermann
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101066 - Sicherheit, EDV und Recht im Straßenwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6233906	Sicherheitsmanagement im Straßenwesen	2 SWS	Lecture / Practice (VÜ)	Zimmermann
Exams					
WS 18/19	8240101674	Safety Management in Highway Engineering		Prüfung (PR)	Zimmermann

Competence Certificate
oral exam with 15 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.338 Course: Sales Management and Retailing [T-WIWI-102890]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101487 - Sales Management
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2572156	Sales Management and Retailing	2 SWS	Lecture (V)	Klarmann
Exams					
WS 18/19	7900080	Sales Management and Retailing		Prüfung (PR)	Klarmann
WS 18/19	7900125	Sales Management and Retailing		Prüfung (PR)	Klarmann

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendation
None

Annotation
The lecture is compulsory for the module Sales Management. It is taught in English.
For further information please contact Marketing and Sales Research Group (marketing.iism.kit.edu).

Below you will find excerpts from events related to this course:

V Sales Management and Retailing

2572156, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The aim of the course "Sales Management and Retailing" is on the one hand to give insights into the challenging realization of a successful sales management and on the other hand to discuss peculiarities of retailing contexts. The contents are below others:

- Customer relationship management (word-of-mouth-analysis, key account management, loyalty programs, complain management etc.)
- Retail marketing (trends, point of sale design etc.)
- Retailer-producer relationships

Annotation
For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

This course is held in English.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Homburg, Christian (2016), Marketingmanagement, 6. ed., Wiesbaden.

T 7.339 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-101279 - 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 7.340 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-101279 - 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 7.341 Course: Selected Issues in Critical Information Infrastructures [T-WIWI-109251]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each summer term	1

Exams				
SS 2019	7900114	Selected Issues in Critical Information Infrastructures	Prüfung (PR)	Sunyaev

Competence Certificate
non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015). Details will be announced in the respective course.

Prerequisites
None.

T 7.342 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 7.343 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-MACH-101290 - BioMEMS
M-MACH-101292 - Mikrooptik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each term	1

Competence Certificate
Oral examination

Prerequisites
none

T 7.344 Course: Semantic Web Technologies [T-WIWI-102874]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	1

Events					
SS 2019	2511310	Semantic Web Technologies	2 SWS	Lecture (V)	Sure-Vetter, Acosta Deibe, Käfer
SS 2019	2511311	Exercises to Semantic Web Technologies	1 SWS	Practice (Ü)	Sure-Vetter, Acosta Deibe, Käfer
Exams					
WS 18/19	7900022	Semantic Web Technologies		Prüfung (PR)	Sure-Vetter
SS 2019	7900028	Semantic Web Technologies		Prüfung (PR)	Sure-Vetter

Competence Certificate
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None

Recommendation
Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required.

Below you will find excerpts from events related to this course:

V Semantic Web Technologies

2511310, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
The aim of the Semantic Web is to make the meaning (semantics) of data on the web usable in intelligent systems, e.g. in e-commerce and internet portals

Central concepts are the representation of knowledge in form of RDF and ontologies, the access via Linked Data, as well as querying the data by using SPARQL. This lecture provides the foundations of knowledge representation and processing for the corresponding technologies and presents example applications.

Learning Content
The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Workload

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Additional Literature

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. http://www.w3.org/TR/webarch/
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

V Exercises to Semantic Web Technologies

2511311, SS 2019, 1 SWS, Open in study portal

Practice (Ü)

Description
Multiple exercises are held that capture the topics, held in the lecture Semantic Web Technologies, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

Learning Content
The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Workload
The total workload for the lecture Semantic Web Technologiesis given out on the description of the lecture.

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web – Grundlagen. Springer, 2008.
- John Domingue, Dieter Fensel, James A. Hendler (Editors). Handbook of Semantic Web Technologies. Springer, 2011.

Additional Literature

- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer, 2003.
- Tim Berners-Lee. Weaving the Web. Harper, 1999 geb. 2000 Taschenbuch.
- Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. http://www.w3.org/TR/webarch/
- Dean Allemang. Semantic Web for the Working Ontologist: Effective Modeling in RDFS and OWL. Morgan Kaufmann, 2008.
- Tom Heath and Chris Bizer. Linked Data: Evolving the Web into a Global Data Space. Synthesis Lectures on the Semantic Web: Theory and Technology, 2011.

T 7.345 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-101808 - 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 7.346 Course: Seminar in Business Administration A (Master) [T-WIWI-103474]

Responsible: Professorenschaft des Fachbereichs Betriebswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2500002	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
WS 18/19	2530293	Seminar in Finance (Master)	2 SWS	Seminar (S)	Ruckes, Hoang, Luedecke, Strych, Benz, Scholz-Daneshgari, Schubert
WS 18/19	2530374	Applied Risk and Asset Management	2 SWS	Seminar (S)	Ulrich
WS 18/19	2540510	Master Seminar in Information Engineering and Management	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	2540559	Digital Service Design Seminar	3 SWS	Seminar (S)	Mädche
WS 18/19	2572181	Seminar in Marketing und Vertrieb (Master)	SWS	Seminar (S)	Klarmann
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	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	2400121	Interactive Analytics Seminar	2 SWS	Proseminar (PS)	Beigl, Mädche, Pescara, Toreini
SS 2019	2500006	Seminar Human Resource Management (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2500007	Seminar Human Resources and Organizations (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2530372	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
SS 2019	2530374	Applied Risk and Asset Management	2 SWS	Seminar (S)	Ulrich
SS 2019	2530580	Seminar in Finance (Master, Prof. Uhrig-Homburg)	2 SWS	Seminar (S)	Uhrig-Homburg, Hofmann, Reichenbacher, Eska
SS 2019	2540510	Masterseminar Big Data Mining in Finance	2 SWS	Seminar (S)	Geyer-Schulz
SS 2019	2550493	Hospital Management	2 SWS	Block (B)	Hansis
SS 2019	2577915	Strategische Unternehmensführung	2 SWS	Seminar (S)	Klopfer

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	7900008	Applied Risk and Asset Management		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	7900037	Analyzing and Evaluating Innovation Processes		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900041	Current Issues in Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900106	Hospital Management		Prüfung (PR)	Nickel
WS 18/19	7900133	Digital Service Design Seminar		Prüfung (PR)	Mädche
WS 18/19	7900159	Seminar in Marketing and Sales		Prüfung (PR)	Klarmann
WS 18/19	7900163	Seminar Human Resource Management (Master)		Prüfung (PR)	Nieken
WS 18/19	7900164	Seminar Human Resources and Organizations (Master)		Prüfung (PR)	Nieken
WS 18/19	7900165	Seminar Digital Experience and Participation		Prüfung (PR)	Weinhardt
WS 18/19	7900184	Seminar in Finance (Master)		Prüfung (PR)	Ruckes
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	7900237	Case Studies Seminar: Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900239	Technologies for Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900252	Seminar in Business Administration A (Master)		Prüfung (PR)	Satzger
WS 18/19	7900267	Seminar in Business Administration A (Master)		Prüfung (PR)	Satzger
WS 18/19	7900283	Seminar Electronic Markets and User Behavior		Prüfung (PR)	Weinhardt
WS 18/19	79-2579905-02	Special Topics in Management Accounting (Master)		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	7900008	Hospital Management		Prüfung (PR)	Nickel
SS 2019	7900017	Soziale Innovationen unter die Lupe genommen		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900055	Roadmapping		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900093	Seminar in Business Administration A		Prüfung (PR)	Weinhardt
SS 2019	7900127	Seminar in Business Administration A (Master)		Prüfung (PR)	Uhrig-Homburg
SS 2019	7900242	Applied Risk and Asset Management		Prüfung (PR)	Ulrich

SS 2019	7900284	Digital Transformation and Business Models	Prüfung (PR)	Weissenberger-Eibl
SS 2019	79-2579904-02	Seminar Management Accounting (Master)	Prüfung (PR)	Wouters
SS 2019	79-2579905-02	Seminar Special Topics in Management Accounting (Master)	Prüfung (PR)	Wouters

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 Automated Financial Advisory
2500002, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V Master Seminar in Information Engineering and Management
2540510, WS 18/19, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
The seminar servers on one hand to improve the scientific working skills. On the other hand, the student should work intensively on a given topic and develop a scientific work, that is based on a profound literature research.

The seminar can also be a implementation of software for a scientific problem (e.g. Business Games/dynamic systems) according to the individual focus in the current semester. The software has to be well documented. The written elaboration covers a description and explanation of the software as well as a discussion about limits and extensibility. Furthermore the software must be deployable und shall be presented on the infrastructure stack of the chair. An implementation of a software has to examine the scientific state of the art in a critical way, too.

A concrete description of the current topics is announced in time for the begin of the application stage.

Workload
The total workload for this course is approximately 90 hours (3 ECTS). Depending on the realization of the work, the times may vary. The main focus is always on working independently.

V Digital Service Design Seminar

2540559, WS 18/19, 3 SWS, Open in study portal

Seminar (S)

Description
Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: “The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes.” Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management.** The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

Learning Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

V Seminar in Marketing und Vertrieb (Master)

2572181, 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 master thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, writing comprehensively, and identification of research gaps.

Annotation
Students interested in master thesis positions at the chair of marketing should participate in the marketing seminar. For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu)

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
will be announced in the seminary.

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 Seminar Human Resource Management (Master)
2500006, 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 Human Resources and Organizations (Master)
2500007, 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 Automated Financial Advisory
2530372, SS 2019, 2 SWS, Open in study portal — **Seminar (S)**

Learning Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

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 Masterseminar Big Data Mining in Finance

2540510, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Literature
Literature:

- Goodfellow, I., Bengio, Y., & Courville, A. (2017). Deep Learning. MIT Press.
- Jean, N., Burke, M., Xie, M., Davis, W. M., Lobell, D. B., & Ermon, S. (2016). Combining satellite imagery and machine learning to predict poverty. *Science*, *353*(6301), 790-794.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. N*ature*, *521*(7553), 436-444.
- Leskovec, J., Rajaraman, A., & Ullman, J. D. (2014). Mining of Massive Datasets. Cambridge University Press.
- Lopez De Prado, M. (2018). Advances in Financial Machine Learning. John Wiley & Sons

V Hospital Management

2550493, SS 2019, 2 SWS, Open in study portal

Block (B)

Description
The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.

Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Learning Content
The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.

Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Annotation
It is planned to offer the course every semester.

Workload
The total workload for this course is approximately 90 hours.

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 7.347 Course: Seminar in Business Administration B (Master) [T-WIWI-103476]

Responsible: Professorenschaft des Fachbereichs Betriebswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2500002	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
WS 18/19	2530293	Seminar in Finance (Master)	2 SWS	Seminar (S)	Ruckes, Hoang, Luedecke, Strych, Benz, Scholz-Daneshgari, Schubert
WS 18/19	2530374	Applied Risk and Asset Management	2 SWS	Seminar (S)	Ulrich
WS 18/19	2540510	Master Seminar in Information Engineering and Management	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	2540559	Digital Service Design Seminar	3 SWS	Seminar (S)	Mädche
WS 18/19	2572181	Seminar in Marketing und Vertrieb (Master)	SWS	Seminar (S)	Klarmann
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	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	2500006	Seminar Human Resource Management (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2500007	Seminar Human Resources and Organizations (Master)	2 SWS	Seminar (S)	Nieken, Mitarbeiter
SS 2019	2530372	Automated Financial Advisory	2 SWS	Seminar (S)	Ulrich
SS 2019	2530374	Applied Risk and Asset Management	2 SWS	Seminar (S)	Ulrich
SS 2019	2530580	Seminar in Finance (Master, Prof. Uhrig-Homburg)	2 SWS	Seminar (S)	Uhrig-Homburg, Hofmann, Reichenbacher, Eska
SS 2019	2540510	Masterseminar Big Data Mining in Finance	2 SWS	Seminar (S)	Geyer-Schulz
SS 2019	2550493	Hospital Management	2 SWS	Block (B)	Hansis
SS 2019	2577915	Strategische Unternehmensführung	2 SWS	Seminar (S)	Klopfer
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	7900008	Applied Risk and Asset Management		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	7900037	Analyzing and Evaluating Innovation Processes		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900041	Current Issues in Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900106	Hospital Management		Prüfung (PR)	Nickel
WS 18/19	7900133	Digital Service Design Seminar		Prüfung (PR)	Mädche
WS 18/19	7900159	Seminar in Marketing and Sales		Prüfung (PR)	Klarmann
WS 18/19	7900163	Seminar Human Resource Management (Master)		Prüfung (PR)	Nieken
WS 18/19	7900164	Seminar Human Resources and Organizations (Master)		Prüfung (PR)	Nieken
WS 18/19	7900165	Seminar Digital Experience and Participation		Prüfung (PR)	Weinhardt
WS 18/19	7900184	Seminar in Finance (Master)		Prüfung (PR)	Ruckes
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	7900237	Case Studies Seminar: Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900239	Technologies for Innovation Management		Prüfung (PR)	Weissenberger-Eibl
WS 18/19	7900255	Seminar in Business Administration B (Master)		Prüfung (PR)	Satzger
WS 18/19	7900283	Seminar Electronic Markets and User Behavior		Prüfung (PR)	Weinhardt
WS 18/19	79-2579905-02	Special Topics in Management Accounting (Master)		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	7900008	Hospital Management		Prüfung (PR)	Nickel
SS 2019	7900017	Soziale Innovationen unter die Lupe genommen		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900055	Roadmapping		Prüfung (PR)	Weissenberger-Eibl
SS 2019	7900093	Seminar in Business Administration A		Prüfung (PR)	Weinhardt
SS 2019	7900127	Seminar in Business Administration A (Master)		Prüfung (PR)	Uhrig-Homburg
SS 2019	7900242	Applied Risk and Asset Management		Prüfung (PR)	Ulrich
SS 2019	7900284	Digital Transformation and Business Models		Prüfung (PR)	Weissenberger-Eibl
SS 2019	79-2579904-02	Seminar Management Accounting (Master)		Prüfung (PR)	Wouters

SS 2019	79-2579905-02	Seminar Special Topics in Management Accounting (Master)	Prüfung (PR)	Wouters

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) 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 **Automated Financial Advisory** — **Seminar (S)**
2500002, WS 18/19, 2 SWS, Open in study portal

Learning Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

V **Master Seminar in Information Engineering and Management** — **Seminar (S)**
2540510, WS 18/19, 2 SWS, Open in study portal

Learning Content
The seminar servers on one hand to improve the scientific working skills. On the other hand, the student should work intensively on a given topic and develop a scientific work, that is based on a profound literature research.

The seminar can also be a implementation of software for a scientific problem (e.g. Business Games/dynamic systems) according to the individual focus in the current semester. The software has to be well documented. The written elaboration covers a description and explanation of the software as well as a discussion about limits and extensibility. Furthermore the software must be deployable und shall be presented on the infrastructure stack of the chair. An implementation of a software has to examine the scientific state of the art in a critical way, too.

A concrete description of the current topics is announced in time for the begin of the application stage.

Workload
The total workload for this course is approximately 90 hours (3 ECTS). Depending on the realization of the work, the times may vary. The main focus is always on working independently.

V **Digital Service Design Seminar** — **Seminar (S)**
2540559, WS 18/19, 3 SWS, Open in study portal

Description
Contemporary trends of every increasing digitalization in businesses lead to new challenges and fusion of technologies blurring the lines between the digital, physical and biological spheres, thereby calling for a new approaches for corporate management. Recently, physician Michio Kaku put it like the following: “The destiny of computers – like other mass technologies like electricity, paper, and running water- is to become invisible, that is, to disappear into the fabric of our lives, to be everywhere and nowhere, silently and seamlessly carrying out our wishes.” Michio Kaku (2016)

In the Practical Seminar Digital Service Design students address a real-world challenge in businesses and apply digital service design practices and tools. Furthermore, during the time of the seminar the students prototypical implement a running digital service.

Real-world challenges will vary over time. This time, the challenges are from the domain of **Future Corporate Management.** The practical seminar is carried out in close cooperation with SAP SE and leverages state-of-the-art digital platforms for prototyping.

Learning Content

- Foundations
- Digital Service Design Challenges in Future Corporate Management
- Basics of Digital Service Design practices and tools
- Prototyping and development Digital Services
- Delivering digital service prototypes

V **Seminar in Marketing und Vertrieb (Master)** **Seminar (S)**
2572181, WS 18/19, SWS, Open in study portal

Learning Content
The seminary teaches students to gain a systematic overview of a field of literature in Marketing - an important prerequisite for a successful master thesis. Central aspects are identification of relevant literature sources, systematization of the field, working out central insights, writing comprehensively, and identification of research gaps.

Annotation
Students interested in master thesis positions at the chair of marketing should participate in the marketing seminar. For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu)

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
will be announced in the seminary.

V **Seminar Human Resources and Organizations** **Seminar (S)**
2573010, WS 18/19, 2 SWS, Open in study portal

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** **Seminar (S)**
2573011, WS 18/19, 2 SWS, Open in study portal

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 (Master)
2500006, 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 Human Resources and Organizations (Master)
2500007, 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 Automated Financial Advisory
2530372, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Learning Content
At the beginning of the semester, a selection of seminar topics will be discussed with each student of the seminar.

Workload
The total workload for this course is approximately 90 hours.

Literature
Literature will be distributed during the first lecture.

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 Masterseminar Big Data Mining in Finance

2540510, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Literature
Literature:

- Goodfellow, I., Bengio, Y., & Courville, A. (2017). Deep Learning. MIT Press.
- Jean, N., Burke, M., Xie, M., Davis, W. M., Lobell, D. B., & Ermon, S. (2016). Combining satellite imagery and machine learning to predict poverty. *Science*, *353*(6301), 790-794.
- LeCun, Y., Bengio, Y., & Hinton, G. (2015). Deep learning. N*ature*, *521*(7553), 436-444.
- Leskovec, J., Rajaraman, A., & Ullman, J. D. (2014). Mining of Massive Datasets. Cambridge University Press.
- Lopez De Prado, M. (2018). Advances in Financial Machine Learning. John Wiley & Sons

V Hospital Management

2550493, SS 2019, 2 SWS, Open in study portal

Block (B)

Description
The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.

Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Learning Content
The seminar 'Hospital Management' presents internal organization structures, work conditions and work environments at the example of hospitals und relates this to common and expected conditions of other service industries.

Covered topics include normative environment, intra-organizational structure, personnel management, quality, external networking and market appearance. The course consists of two full-day sessions.

Annotation
It is planned to offer the course every semester.

Workload
The total workload for this course is approximately 90 hours.

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 7.348 Course: Seminar in Economic Policy [T-WIWI-102789]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101514 - Innovationsökonomik
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
Exams					
WS 18/19	7900094	Selected Topics in Text Mining - Cooperation Seminar AIFB and ECON		Prüfung (PR)	Sure-Vetter, Ott

Competence Certificate
The assessment is carried out through a term paper within the range of 12 to 15 pages, a presentation of the results of the work in a seminar meeting, and active participation in the discussions of the seminar meeting (§ 4 (2), 3 SPO).

The final grade is composed of the weighted graded examinations. (Essay 50%, 40% oral presentation, active participation 10%).

Prerequisites
None

Recommendation
At least one of the lectures "Theory of Endogenous Growth" or "Innovation Theory and Policy" should be attended in advance, if possible.

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

T 7.349 Course: Seminar in Economics A (Master) [T-WIWI-103478]

Responsible: Professorenschaft des Fachbereichs Volkswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - 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	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	2521310	Advanced Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görgen
SS 2019	2560282	Wirtschaftspolitisches Seminar	2 SWS	Seminar (S)	Ott, Assistenten
SS 2019	2560552	Topics in Political Economics (Master)	2 SWS	Seminar (S)	Szech, Maus
SS 2019	2560554	Morals and Social Behavior (Master)	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	7900257	Date Mining		Prüfung (PR)	Nakhaeizadeh
WS 18/19	7900260	Big Data Mining in Finance. Seminar in Economics A (Master)		Prüfung (PR)	Schienle
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	79sefi2	Seminar in Economics A (Master)		Prüfung (PR)	Wigger
SS 2019	7900059	Seminar in Economics B (Master)		Prüfung (PR)	Szech
SS 2019	7900060	Seminar in Economics B (Master)		Prüfung (PR)	Szech
SS 2019	79sefi2	Seminar in Economics A (Master)		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.

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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** **Seminar (S)**
2520405, WS 18/19, SWS, Open in study portal

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 on Political Economics — Seminar (S)
2560140, WS 18/19, 2 SWS, Open in study portal

Workload
About 90 hours.

V Advanced Topics in Econometrics — Seminar (S)
2521310, SS 2019, 2 SWS, Open in study portal

Annotation
The course will be offered in English.

V Topics in Political Economics (Master) — Seminar (S)
2560552, SS 2019, 2 SWS, Open in study portal

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 (Master)

2560554, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Description
For a long time, economists studied given markets and mechanisms to predict outcomes, future developments or generally the participants' behavior. In contrast, Market Design uses theory, empirical and experimental work to design markets which incentivize their participants in a way that leads to a "desirable" outcome. In this, the designer can have different objectives, for example: Maximizing efficiency, welfare or minimizing negative externalities.

Prominent applications of Market Design include, quite topical, Germany's auction of 5G mobile licenses and matching markets, where there are two large populations that need to be matched to one another (think of hospitals and interns, students and dorm rooms or kidney donors and receivers). In this seminar, we think about ways to either design new markets or how we could alter existing ones in a socially beneficial way. Alternatively, research ideas could focus on finding failures or shortcomings of ineffectively designed markets.

Notes
Participation will be limited to 12 students.

Annotation
For further questions, please contact David Huber (david.huber@kit.edu).

Workload
About 90 hours.

T 7.350 Course: Seminar in Economics B (Master) [T-WIWI-103477]

Responsible: Professorenschaft des Fachbereichs Volkswirtschaftslehre
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - 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	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	2521310	Advanced Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görgen
SS 2019	2560282	Wirtschaftspolitisches Seminar	2 SWS	Seminar (S)	Ott, Assistenten
SS 2019	2560552	Topics in Political Economics (Master)	2 SWS	Seminar (S)	Szech, Maus
SS 2019	2560554	Morals and Social Behavior (Master)	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	7900259	Seminar in Economics B (Master)		Prüfung (PR)	Schienle
WS 18/19	7900278	Seminar on Morals and Social Behavior		Prüfung (PR)	Szech
WS 18/19	7900281	Seminar in Economics B (Master)		Prüfung (PR)	Mitusch
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	79sefi3	Seminar in Economics B (Master)		Prüfung (PR)	Wigger
SS 2019	7900059	Seminar in Economics B (Master)		Prüfung (PR)	Szech
SS 2019	7900060	Seminar in Economics B (Master)		Prüfung (PR)	Szech
SS 2019	79sefi3	Seminar in Economics B (Master)		Prüfung (PR)	Wigger

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 **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** **Seminar (S)**
2520405, WS 18/19, SWS, Open in study portal

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 on Political Economics — Seminar (S)
2560140, WS 18/19, 2 SWS, Open in study portal

Workload
About 90 hours.

V Advanced Topics in Econometrics — Seminar (S)
2521310, SS 2019, 2 SWS, Open in study portal

Annotation
The course will be offered in English.

V Topics in Political Economics (Master) — Seminar (S)
2560552, SS 2019, 2 SWS, Open in study portal

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 (Master)

2560554, SS 2019, 2 SWS, Open in study portal

Seminar (S)

Description
For a long time, economists studied given markets and mechanisms to predict outcomes, future developments or generally the participants' behavior. In contrast, Market Design uses theory, empirical and experimental work to design markets which incentivize their participants in a way that leads to a "desirable" outcome. In this, the designer can have different objectives, for example: Maximizing efficiency, welfare or minimizing negative externalities.

Prominent applications of Market Design include, quite topical, Germany's auction of 5G mobile licenses and matching markets, where there are two large populations that need to be matched to one another (think of hospitals and interns, students and dorm rooms or kidney donors and receivers). In this seminar, we think about ways to either design new markets or how we could alter existing ones in a socially beneficial way. Alternatively, research ideas could focus on finding failures or shortcomings of ineffectively designed markets.

Notes
Participation will be limited to 12 students.

Annotation
For further questions, please contact David Huber (david.huber@kit.edu).

Workload
About 90 hours.

T 7.351 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-101808 - 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.

Recommendation
None

T 7.352 Course: Seminar in Informatics A (Master) [T-WIWI-103479]

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2400125	Seminar "Privacy Awareness"	2 SWS	Seminar (S)	Boehm, Volkamer, Gerber
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	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	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	7900038	Linked Data and the Semantic Web		Prüfung (PR)	Sure-Vetter
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	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 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
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** **Seminar / Practical course (S/P)**
2512311, WS 18/19, 3 SWS, Open in study portal

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

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 Emerging Trends in Critical Information Infrastructures

Seminar (S)

2513400, WS 18/19, 2 SWS, Open in study portal

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

Seminar (S)

2595470, WS 18/19, 2 SWS, Open in study portal

Learning Content

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload

The total workload for this course is approximately 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 7.353 Course: Seminar in Informatics B (Master) [T-WIWI-103480]

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	2400125	Seminar "Privacy Awareness"	2 SWS	Seminar (S)	Boehm, Volkamer, Gerber
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	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	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	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	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.

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.

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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** **Seminar / Practical course (S/P)**
2512311, WS 18/19, 3 SWS, Open in study portal

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

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 Emerging Trends in Critical Information Infrastructures

Seminar (S)

2513400, WS 18/19, 2 SWS, Open in study portal

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

Seminar (S)

2595470, WS 18/19, 2 SWS, Open in study portal

Learning Content

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Workload

The total workload for this course is approximately 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 7.354 Course: Seminar in Operations Research A (Master) [T-WIWI-103481]

Responsible: Prof. Dr. Stefan Nickel
Prof. Dr. Steffen Rebennack
Prof. Dr. Oliver Stein

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
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	2550473	Seminar on Power Systems Optimization (Master)	2 SWS	Seminar (S)	Rebennack, Assistenten
SS 2019	2550491	Seminar zur diskreten Optimierung	SWS	Block (B)	Nickel, Mitarbeiter
Exams					
WS 18/19	7900217_WS1819	Seminar in Operations Research A (Master)		Prüfung (PR)	Stein
WS 18/19	7900263	Seminar in Operations Research A (Master)		Prüfung (PR)	Nickel
SS 2019	7900018_SS2019	Seminar in Operations Research A (Master)		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: 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 7.355 Course: Seminar in Operations Research B (Master) [T-WIWI-103482]

Responsible: Prof. Dr. Stefan Nickel
Prof. Dr. Steffen Rebennack
Prof. Dr. Oliver Stein

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
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	2550473	Seminar on Power Systems Optimization (Master)	2 SWS	Seminar (S)	Rebennack, Assistenten
SS 2019	2550491	Seminar zur diskreten Optimierung	SWS	Block (B)	Nickel, Mitarbeiter
Exams					
SS 2019	7900018_SS2019	Seminar in Operations Research A (Master)		Prüfung (PR)	Stein

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 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 7.356 Course: Seminar in Statistics A (Master) [T-WIWI-103483]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
SS 2019	2521310	Advanced Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, Görgen
Exams					
WS 18/19	7900257	Date Mining		Prüfung (PR)	Nakhaeizadeh

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 Advanced Topics in Econometrics

2521310, SS 2019, 2 SWS, Open in study portal **Seminar (S)**

Annotation
The course will be offered in English.

T 7.357 Course: Seminar in Statistics B (Master) [T-WIWI-103484]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
SS 2019	2521310	Advanced Topics in Econometrics	2 SWS	Seminar (S)	Schienle, Chen, 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 Advanced Topics in Econometrics

2521310, SS 2019, 2 SWS, Open in study portal **Seminar (S)**

Annotation
The course will be offered in English.

T 7.358 Course: Seminar in Transportation [T-BGU-100014]

Responsible: Bastian Chlond
Prof. Dr.-Ing. Peter Vortisch

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-101808 - Seminarmodul
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
WS 18/19	6232903	Seminar Verkehrswesen	2 SWS	Seminar (S)	Vortisch, KIT
SS 2019	6232903	Seminar Verkehrswesen	2 SWS	Seminar (S)	Vortisch, Kagerbauer
Exams					
WS 18/19	8245100014	Seminar in Transportation		Prüfung (PR)	Vortisch, Chlond

Competence Certificate
seminar paper, appr. 10 pages, and presentation, appr. 10 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.359 Course: Seminar Mobility Services (Master) [T-WIWI-103174]

Responsible: Prof. Dr. Gerhard Satzger
Carola Stryja

Organisation: KIT Department of Economics and Management

Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	1

Competence Certificate
A final written exam will be conducted.

Prerequisites
None

Annotation
The course is not offered regularly.

T 7.360 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-101808 - 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 7.361 Course: Seminar Sensors [T-ETIT-100707]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101158 - Sensorik I
M-ETIT-101159 - Sensorik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung anderer Art	3	1

Events					
WS 18/19	2304233	Seminar Sensorik	2 SWS	Seminar (S)	Menesklou
SS 2019	2304233	Seminar Sensorik	2 SWS	Seminar (S)	Menesklou
Exams					
WS 18/19	7304233	Seminar Sensors		Prüfung (PR)	Menesklou

T 7.362 Course: Seminar: Governance, Risk & Compliance [T-INFO-102047]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101242 - Governance, Risk & Compliance
M-WIWI-104903 - Recht
M-WIWI-104909 - Informatik (KIT-Fakultät für Informatik)

Type	Credits	Version
Prüfungsleistung anderer Art	3	1

Events					
SS 2019	2400041	Governance, Risk & Compliance	2 SWS	Seminar (S)	Herzig

T 7.363 Course: Seminar: Legal Studies I [T-INFO-101997]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-WIWI-101808 - 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 7.364 Course: Seminar: Legal Studies II [T-INFO-105945]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-WIWI-101808 - Seminarmodul
M-WIWI-104903 - Recht

Type	Credits	Version
Prüfungsleistung anderer Art	3	1

Events					
WS 18/19	2400014	Current Issues in Patent Law	2 SWS	Seminar (S)	Melullis
WS 18/19	2400125	Seminar "Privacy Awareness"	2 SWS	Seminar (S)	Boehm, Volkamer, Gerber
WS 18/19	24186	Patents at the point of intersection between technology, economy and law	2 SWS	Seminar (S)	Dammler
WS 18/19	24389	IT-Sicherheit und Recht	2 SWS	Seminar (S)	Schallbruch
SS 2019	2400061	Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung	2 SWS	Seminar (S)	Bless, Boehm, Hartenstein, Mädche, Sunyaev, Zitterbart
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

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 7.365 Course: Sensor Systems [T-ETIT-100709]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101158 - Sensorik I
M-ETIT-101159 - Sensorik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

T 7.366 Course: Sensors [T-ETIT-101911]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101158 - Sensorik I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2304231	Sensoren	2 SWS	Lecture (V)	Menesklou
Exams					
WS 18/19	7304231	Sensors		Prüfung (PR)	Menesklou

T 7.367 Course: Sensors and Actuators Laboratory [T-ETIT-100706]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101158 - Sensorik I
M-ETIT-101159 - Sensorik II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	6	Each summer term	1

T 7.368 Course: Service Analytics A [T-WIWI-105778]

Responsible: Prof. Dr. Hansjörg Fromm
Prof.Dr. Thomas Setzer

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101448 - Service Management
M-WIWI-101470 - Data Science: Advanced CRM
M-WIWI-101506 - Service Analytics
M-WIWI-103117 - Data Science: Data-Driven Information Systems
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2595501	Service Analytics A	2 SWS	Lecture (V)	Fromm, Setzer
SS 2019	2595502	Übung zu Service Analytics A	1 SWS	Practice (Ü)	Baier, Kühl
Exams					
WS 18/19	00104	Service Analytics A		Prüfung (PR)	Fromm, Setzer

Competence Certificate
The assessment consists of a written exam (60 min) according to §4(2), 1 of the examination regulations.

Prerequisites
None

Recommendation
The lecture is addresed to students with interests and basic knowledge in the topics of Operations Research, decritptive and inductive statistics.

Below you will find excerpts from events related to this course:

V Service Analytics A

2595501, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Today's service-oriented companies are starting to optimize the way services are planned, operated, and personalized by analyzing vast amounts of data from customers, IT-systems, or sensors. As the statistical learning and business optimization world continues to progress, skills and expertise in advanced data analytics and data and fact-based optimization become vital for companies to be competitive. In this lecture, relevant methods and tools will be considered as a package, with a strong focus on their inter-relations. Students will learn to analyze and structure large amounts of potentially incomplete and unreliable data, to apply multivariate statistics to filter data and to extract key features, to predict future behavior and system dynamics, and finally to formulate data and fact-based service planning and decision models.

More specifically, the lessons of this lecture will include:

- Co-Creation of Value Across Enterprises
- Instrumentation, Measurement, Monitoring of Service Systems
- Descriptive, predictive, and prescriptive Analytics
- Usage Characteristics and Customer Dynamics
- Big Data, Dimensionality Reduction, and Real-Time Analytics
- System Models and What-If-Analysis
- Robust Mechanisms for Service Management
- Industry Applications of Service Analytics

Tutorials
Students will conduct lecture accompanying, guided exercises throughout the semester.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Business Forecasting, Wilson, J. H., Keating, B., McGraw-Hill, 2002
- Multivariate Data Analysis, Hair, J. F., Black, B., Babin, B., Anderson, R. E., 2008
- Analytics at Work, Davenport, T. H., Harris, J. G., Morion, R., Harward Business Press, 2010
- Business Analytics for Managers, Jank, W., Springer, 2011

Online Sources:

- The data deluge, The Economist, Feb. 2010
- Competing on Analytics, T. Davenport in Harward Business Review, Feb. 2007
- Mit Advanced Analytics können Händler Kundendaten optimal nutzen, McKinsey Handelsmarketing, Feb. 2011

Further readings will be provided in the lecture.

T 7.369 Course: Service Design Thinking [T-WIWI-102849]

Responsible: Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101503 - Service Design Thinking
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	9	Irregular	2

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
The course is compulsory and must be examined.

Recommendation
This course is held in English – proficiency in writing and communication is required.

Our past students recommend to take this course at the beginning of the masters program.

Annotation
Due to practical project work as a component of the program, access is limited.
The module (as well as the module component) spans two semesters. It starts in September every year and runs until end of June in the subsequent year. Entering the program is only possible at its beginning - after prior application in May/June.
For more information on the application process and the program itself are provided in the module component description and the program's website (http://sdt-karlsruhe.de).
Furthermore, the KSRI conducts an information event for applicants every year in May.
This module is part of the KSRI Teaching Program „Digital Service Systems“. For more information see the KSRI Teaching website: www.ksri.kit.edu/teaching.

T 7.370 Course: Service Innovation [T-WIWI-102641]

Responsible: Prof. Dr. Gerhard Satzger
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101448 - Service Management
M-WIWI-102806 - Service Innovation, Design & Engineering
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2595468	Service Innovation	2 SWS	Lecture (V)	Satzger
Exams					
WS 18/19	7900186	Service Innovation		Prüfung (PR)	Satzger

Competence Certificate
The assessment consists of an 1h written exam (following §4(2) 1 of the examination regulations) and of assignments during the course as an non exam assessment (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015).

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Service Innovation
2595468, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
While innovation in manufacturing or agriculture can leverage a considerable body of research, experience and best practice, innovation in services has not reached the same level of maturity. In practice - while many organizations have a well-understood process for innovating in the product business - innovating in services is often still a fuzzy and complex undertaking.

In this lecture we will

- discuss the state of research
- compare product and service innovation
- understand how innovation diffusion works
- examine case studies of service innovation
- compare open vs. closed innovation
- learn how to leverage user communities to drive innovation and
- understand obstacles, and enablers and how to manage, incentivize and foster service innovation

Learning Content
While innovation in manufacturing can leverage a considerable body of research, experience and best practice, innovation in services has not reached the same level of maturity. In practice, while many organizations have a well-understood process for innovating in the product business, innovating in services is often still a fuzzy and complex undertaking. In this lecture we will discuss the state of research, compare product and service innovation and understand how innovation diffusion works. We examine case studies on service innovation, compare open vs. closed innovation and learn how to apply different innovation tools, methods and strategies (e.g. service design thinking as a human-centered approach to innovation or technology and strategic foresight, as methods supporting the generation of assumptions on the impact of technology).

Annotation
The credits have been changed from 5 to 4,5.

Workload
Total workload: approximately 136 hours

Attendance time: 30 hours

Self-study: 105 hours

Literature

- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). Fundamentals of service systems (Vol. 12). Heidelberg: Springer.
- Lusch, R. F., & Nambisan, S. (2015). Service innovation: A service-dominant logic perspective. MIS quarterly, 39(1).
- Christensen, Clayton M. (2003).The Innovator's Dilemma - when new technologies cause great firms to fail. Boston, Massachusetts:Harvard Business Review Press.
- Rogers, S. (2003). Diffusion of innovations. 5. ed. New York: Free Press.
- Chesbrough, H. W. (2011). Open services innovation - rethinking your business to grow and compete in a new era. 1. ed. San Francisco: Jossey-Bass.
- Uebernickel, F., Brenner, W., Pukall, B., Naef, T., & Schindlholzer, B. (2015). Design Thinking: Das Handbuch. Frankfurt am Main: Frankfurter Allgemeine Buch.
- Runco, M.A. (2014). Creativity – Theories and Themes: Research, Development, and Practice. 2. ed. Amsterdam: Academic Press

T 7.371 Course: Service Oriented Computing [T-WIWI-105801]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	5	Each summer term	2

Exams				
WS 18/19	7900024	Service Oriented Computing	Prüfung (PR)	Sure-Vetter
SS 2019	7900038	Service Oriented Computing	Prüfung (PR)	Sure-Vetter

Competence Certificate
Please note that the exam will be offered to first-time applicants in the winter semester 2018/2019. A last examination possibility exists in the summer semester 2019 (only for repeaters).

The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

Prerequisites
None

T 7.372 Course: Simulation Game in Energy Economics [T-WIWI-108016]

Responsible: Dr. Massimo Genoese
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101451 - Energiewirtschaft und Energiemärkte
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	2581025	Simulation Game in Energy Economics	2 SWS	Lecture / Practice (VÜ)	Genoese

Competence Certificate
Examination as written assignment and oral presentation (§4 (2), 1 SPO).

Prerequisites
None

Recommendation
Visiting the course "Introduction to Energy Economics"

Annotation
See German version.

Below you will find excerpts from events related to this course:

V Simulation Game in Energy Economics

2581025, SS 2019, 2 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content

- Introduction
- Agents and market places in the electricity industry
- Selected planning tasks of energy service companies
- Methods of modelling in the energy sector
- Agent-based simulation: The PowerACE model
- Simulation game: Simulation in energy economics (electricity and emission trading, investment decisions)

The lecture is structured in a theoretical and a practical part. In the theoretical part, the students are taught the basics to carry out simulations themselves in the practical part which comprises amongst others the simulation of the power exchange. The participants of the simulation game take a role as a power trader in the power market. Based on various sources of information (e.g. prognosis of power prices, available power plants, fuel prices), they can launch bids in the power exchange.

Workload
The total workload for this course is approximately 90 hours. For further information see German version.

Literature
Elective literature:

Möst, D. und Genoese, M. (2009): Market power in the German wholesale electricity market. The Journal of Energy Markets (47–74). Volume 2/Number 2, Summer 2009

T 7.373 Course: Simulation of Coupled Systems [T-MACH-105172]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Yusheng Xiang

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-MACH-101267 - Mobile Arbeitsmaschinen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	2

Events					
SS 2019	2114095	Simulation of Coupled Systems	2 SWS	Lecture (V)	Geimer, Xiang
Exams					
WS 18/19	76T-MACH-105172	Simulation of Coupled Systems		Prüfung (PR)	Geimer
SS 2019	76T-MACH-102172	Simulation of Coupled Systems		Prüfung (PR)	Geimer
SS 2019	76T-MACH-105172	Simulation of Coupled Systems		Prüfung (PR)	Geimer

Competence Certificate
The assessment consists of an oral exam (20 min) taking place in the recess period. The exam takes place in every semester. Re-examinations are offered at very ordinary examination date.

A registration in mandatory, the details will be announced on the webpages of the *Institute of Vehicle System Technology / Institute of Mobile Machines.* In case of too many applications, attendance will be granted based on pre-qualification.

Prerequisites
Required for the participation in the examination is the preparation of a report during the semester. The partial service with the code T-MACH-108888 must have been passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-108888 - Simulation of Coupled Systems - Advance must have been passed.

Recommendation

- Knowledge of ProE (ideally in actual version)
- Basic kniwledge of Matlab/Simulink
- Basic knowledge of dynamics of machnies
- Basic knowledge of hydraulics

Annotation
After completion of course, students are able to:

- build a coupled simulation
- parametrize models
- perform simulations
- conduct troubleshooting
- check results for plausibility

The number of participants is limited.

Content:

- Basics of multi-body and hydralics simulation programs
- Possibilities of coupled simulations
- Modelling and Simulation of Mobile Machines using a wheel loader
- Documentation of the result in a short report

Literature:

Software guide books (PDFs)

Information about wheel-type loader specifications

Below you will find excerpts from events related to this course:

V **Simulation of Coupled Systems** **Lecture (V)**
2114095, SS 2019, 2 SWS, Open in study portal

Learning Content

- Knowledge of the basics of multi-body and hydraulic simulation programs
- Possibilities of coupled simulations
- Development of a simulation model by using the example of a wheel loader
- Documentation of the result in a short report

Workload

- regular attendance: 21 hours
- total self-study: 92 hours

Literature
Elective literature:

- miscellaneous guides according the software-tools pdf-shaped
- information to the wheel-type loader

T 7.374 Course: Simulation of Coupled Systems - Advance [T-MACH-108888]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Yusheng Xiang

Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Studienleistung	0	Each summer term	1

Competence Certificate
Preparation of semester report

Prerequisites
none

T 7.375 Course: Simulation of Stochastic Systems [T-WIWI-106552]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Steffen Rebennack

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-103289 - Stochastische Optimierung
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Competence Certificate
The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation. The exam takes place in every the semester.

Prerequisites
None.

T 7.376 Course: Site Management [T-BGU-103427]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	1,5	Each summer term	1

Events					
SS 2019	6241807	Bauleitung	1 SWS	Lecture (V)	Steffek

Prerequisites
None

Recommendation
None

Annotation
None

T 7.377 Course: Smart Energy Infrastructure [T-WIWI-107464]

Responsible: Dr. Armin Ardone
Dr. Dr. Andrej Marko Pustisek

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101452 - Energiewirtschaft und Technologie
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2581023	(Smart) Energy Infrastructure	2 SWS	Lecture (V)	Ardone, Pustisek
Exams					
WS 18/19	7981023	Smart Energy Infrastructure		Prüfung (PR)	Fichtner

Competence Certificate
The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites
None.

Annotation
New course starting winter term 2017/2018.

T 7.378 Course: Smart Grid Applications [T-WIWI-107504]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103720 - eEnergy: Markets, Services and Systems
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2540452	Smart Grid Applications	2 SWS	Lecture (V)	Staudt, van Dinther
WS 18/19	2540453	Übung zu Smart Grid Applications	2 SWS	Lecture (V)	Staudt, Mengelkamp
Exams					
WS 18/19	7900235	Smart Grid Applications		Prüfung (PR)	Weinhardt
WS 18/19	7900288	Smart Grid Applications		Prüfung (PR)	Weinhardt

Competence Certificate
The assessment consists of a written exam (60 min) (according to §4(2), 1 of the examination regulations). By successful completion of the exercises (§4 (2), 3 SPO 2007 respectively §4 (3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None

Recommendation
None

Annotation
The lecture will be read for the first time in winter term 2018/19.

T 7.379 Course: Social Choice Theory [T-WIWI-102859]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101500 - Microeconomic Theory
M-WIWI-101504 - Collective Decision Making
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2520537	Social Choice Theory	2 SWS	Lecture (V)	Puppe, Müller
SS 2019	2520539	Übung zu Social Choice Theory	1 SWS	Practice (Ü)	Puppe, Müller

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Below you will find excerpts from events related to this course:

V Social Choice Theory
2520537, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The course provides a comprehensive treatment of preference and judgement aggregation, including proofs of general results that have Arrow's famous impossibility theorem and Gibbard's oligarchy theorem as corollaries. The second part of the course is devoted to voting theory. Among other things, we prove the Gibbard-Satterthwaite theorem.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Main texts:

- Hervé Moulin: Axioms of Cooperative Decision Making, Cambridge University Press, 1988
- Christian List and Clemens Puppe: Judgement Aggregation. A survey, in: Handbook of rational & social choice, P.Anand, P.Pattanaik, C.Puppe (Eds.), Oxford University Press 2009.

Secondary texts:

- Amartya Sen: Collective Choice and Social Welfare, Holden-Day, 1970
- Wulf Gaertner: A Primer in Social Choice Theory, revised edition, Oxford University Press, 2009
- Wulf Gaertner: Domain Conditions in Social Choice Theory, Oxford University Press, 2001

T 7.380 Course: Sociotechnical Information Systems Development [T-WIWI-109249]

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - Informatik
M-WIWI-101628 - Vertiefung Informatik
M-WIWI-101630 - Wahlpflicht Informatik
M-WIWI-104901 - Informatik (KIT-Fakultät für Wirtschaftswissenschaften)

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2512400	Entwicklung Soziotechnischer Informationssysteme	SWS	Practical course (P)	Sunyaev, Kromat
Exams					
SS 2019	7900016	Sociotechnical Information Systems Development		Prüfung (PR)	Sunyaev

Competence Certificate
The non exam assessment (§4(2), 3 SPO 2007) or alternative exam assessment (§ 4(2), 3 SPO 2015) consists of an implementation and a final thesis documenting the development and use of the application.

Prerequisites
None.

Below you will find excerpts from events related to this course:

V Entwicklung Soziotechnischer Informationssysteme

2512400, WS 18/19, SWS, Open in study portal **Practical course (P)**

Description
The aim of this course is to provide a practical introduction into developing socio-technical information systems, such as web platforms, mobile apps, or desktop applications. Course participants will create (individually or in groups) software solutions for specific problems from various practical domains. The course tasks comprise requirements assessment, system design, and software implementation. Furthermore, course participants will gain insights into software quality assurance methods and software documentation.

Workload
4 ECTS = approx. 120 h

T 7.381 Course: Software Quality Management [T-WIWI-102895]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	1

Events					
SS 2019	2511208	Software Quality Management	2 SWS	Lecture (V)	Oberweis
SS 2019	2511209	Übungen zu Software-Qualitätsmanagement	1 SWS	Practice (Ü)	Oberweis, N.N.
Exams					
WS 18/19	7900027	Software Quality Management		Prüfung (PR)	Oberweis
SS 2019	7900031	Software Quality Management		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites
None

Annotation
This course was formely named "Software Technology: Quality Management".

Below you will find excerpts from events related to this course:

V Software Quality Management
2511208, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
This lecture imparts fundamentals of active software quality management (quality planning, quality testing, quality control, quality assurance) and illustrates them with concrete examples, as currently applied in industrial software development. Keywords of the lecture content are: software and software quality, process models, software process quality, ISO 9000-3, CMM(I), BOOTSTRAP, SPICE, software tests.

Annotation
This course was formely named "Software Technology: Quality Management".

Workload
Lecture 30h
Exercise 15h

Preparation of lecture 30h
Preparation of exercises 30h
Exam preparation 44h
Exam 1h

Total: 150h

Literature

- Helmut Balzert: Lehrbuch der Software-Technik. Spektrum-Verlag 2008
- Peter Liggesmeyer: Software-Qualität, Testen, Analysieren und Verifizieren von Software. Spektrum Akademischer Verlag 2002
- Mauro Pezzè, Michal Young: Software testen und analysieren. Oldenbourg Verlag 2009

Further literature is given in lectures.

T 7.382 Course: Spatial Economics [T-WIWI-103107]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101485 - Verkehrsinfrastrukturpolitik und regionale Entwicklung
M-WIWI-101496 - Wachstum und Agglomeration
M-WIWI-101497 - Agglomeration und Innovation
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Exams				
WS 18/19	7900075	Spatial Economics	Prüfung (PR)	Ott

Competence Certificate
The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required. The attendance of the course Introduction to economic policy [2560280] is recommended.

Annotation
Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

T 7.383 Course: Special Topics in Highway Engineering and Environmental Impact Assessment [T-BGU-101860]

Responsible: Prof. Dr.-Ing. Ralf Roos
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-100999 - Straßenwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6233804	Umweltverträglichkeitsstudien im Straßenwesen	1 SWS	Lecture (V)	Roos
SS 2019	6233807	Besondere Kapitel im Straßenwesen	1 SWS	Lecture (V)	Roos

Competence Certificate
oral exam with 15 minutes

Prerequisites
None

Recommendation
None

Annotation
None

T 7.384 Course: Special Topics in Information Systems [T-WIWI-109940]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101410 - Business & Service Engineering
M-WIWI-101411 - Information Engineering
M-WIWI-101506 - Service Analytics
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 7.385 Course: Special Topics of Enterprise Information Systems [T-WIWI-102676]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 term	1

Events					
WS 18/19	2511228	Spezialvorlesung Betriebliche Informationssysteme: Industrie 4.0	2 SWS	Lecture (V)	Koschmider
Exams					
WS 18/19	7900029	Special Topics of Enterprise Information Systems: Industry 4.0		Prüfung (PR)	Oberweis

Competence Certificate
The assessment of this course is a written examination (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

Please note that the exam "Special Lecture on Business Information Systems: Industry 4.0" will be offered for the last time in summer semester 2019 (only for repeaters).

Prerequisites
None

T 7.386 Course: Specialization in Food Process Engineering [T-CIWVT-101875]

Responsible: Dr. Volker Gaukel
Organisation: KIT Department of Chemical and Process Engineering
Part of: M-CIWVT-101119 - Vertiefung Lebensmittelverfahrenstechnik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	9	1

Events					
WS 18/19	22207	Lebensmittelkunde und -funktionalität	2 SWS	Lecture (V)	Watzl
WS 18/19	22209	Hilfs- und Effektstoffe	1 SWS	Lecture (V)	Karbstein
WS 18/19	22246	Extrusion technology in food processing	1 SWS	Lecture (V)	Emin
SS 2019	22215	Produktgestaltung: Beispiele aus der Praxis	2 SWS	Lecture (V)	Bröckel, Esper, Hirth, Karbstein, Kind, Müller, Nirschl, Sass, Türk
SS 2019	22633	Microbiology for Engineers	2 SWS	Lecture (V)	Schwartz
SS 2019	6601	Grundlagen der Lebensmittelchemie I	2 SWS	Lecture (V)	Bunzel

Prerequisites
The Module "Principles of Food Process Engineering" must be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-CIWVT-101120 - Principles of Food Process Engineering must have been passed.

T 7.387 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-101638 - Ökonometrie und Statistik I
M-WIWI-101639 - Ökonometrie und Statistik II
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 7.388 Course: Stochastic Calculus and Finance [T-WIWI-103129]

Responsible: Dr. Mher Safarian
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101639 - Ökonometrie und Statistik II
M-WIWI-104902 - Statistik

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2521331	Stochastic Calculus and Finance	2 SWS	Lecture (V)	Safarian
Exams					
WS 18/19	7900225	Stochastic Calculus and Finance		Prüfung (PR)	Safarian

Competence Certificate
The assessment of this course consists of a written examination (§4(2), 1 SPOs, 180 min.) and of possibble additional assignments during the course (§4 (3) SPO).

Prerequisites
None

Annotation
For more information see http://statistik.econ.kit.edu/

Below you will find excerpts from events related to this course:

V Stochastic Calculus and Finance

2521331, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus. Stochastic Processes, Brownian Motion and Martingales, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes. Stable and tempered stable processes. Levy processes.
2. Mathematical Finance: Pricing Models. The Black-Scholes Model, State prices and Equivalent Martingale Measure, Complete Markets and Redundant Security Prices, Arbitrage Pricing with Dividends, Term-Structure Models (One Factor Models, Cox-Ingersoll-Ross Model, Affine Models), Term-Structure Derivatives and Hedging, Mortgage-Backed Securities, Derivative Assets (Forward Prices, Future Contracts, American Options, Look-back Options), Option pricing with tempered stable and Levy-Processes and volatility clustering, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem), Equilibrium models, Consumption-Based CAPM, Numerical Methods.

Learning Content
The course will provide rigorous yet focused training in stochastic calculus and finance. The program will cover modern approaches in stochastic calculus and mathematical finance. Topics to be covered:

1. Stochastic Calculus. Stochastic Processes, Brownian Motion and Martingales, Stopping Times, Local martingales, Doob-Meyer Decomposition, Quadratic Variation, Stochastic Integration, Ito Formula, Girsanov Theorem, Jump-diffusion Processes. Stable and tempered stable processes. Levy processes.
2. Mathematical Finance: Pricing Models. The Black-Scholes Model, State prices and Equivalent Martingale Measure, Complete Markets and Redundant Security Prices, Arbitrage Pricing with Dividends, Term-Structure Models (One Factor Models, Cox-Ingersoll-Ross Model, Affine Models), Term-Structure Derivatives and Hedging, Mortgage-Backed Securities, Derivative Assets (Forward Prices, Future Contracts, American Options, Look-back Options), Option pricing with tempered stable and Levy-Processes and volatility clustering, Optimal Portfolio and Consumption Choice (Stochastic Control and Merton continuous time optimization problem), Equilibrium models, Consumption-Based CAPM, Numerical Methods.

Stochastic processes (Poisson-process, Brownian motion, martingales), stochastic Integral (Integral, quadratic und co-variation, Ito-formula), stochastic differential equation for price-processes, trading strategies, option pricing(Feynman-Kac), neutral risk rating(equivalent martingale measure, Girsanov theorem), term structure models

Workload
The total workload for this course is approximately 150 hours. For further information see German version.

Literature
To be announced in lecture.
Elective literature:

- Dynamic Asset Pricing Theory, Third Edition. by Darrell Duffie, Princeton University Press, 1996
- Stochastic Calculus for Finance II: Continuous-Time Models, by Steven E. Shreve , Springer, 2003
- An Introduction to Stochastic Integration (Probability and its Applications) by Kai L. Chung , Ruth J. Williams , Birkhaueser,
- Methods of Mathematical Finance by Ioannis Karatzas , Steven E. Shreve , Springer 1998
- Kim Y.S. ,Rachev S.T. ,Bianchi M-L, Fabozzi F. Financial market models with Levy processes and time-varying volatility, Journal of Banking and Finance, 32/7,1363-1378, 2008.
- Hull, J., Options, Futures, & Other Derivatives, Prentice Hall, Sixth Edition, (2005).

T 7.389 Course: Strategic Management of Information Technology [T-WIWI-102669]

Responsible: Thomas Wolf
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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	1

Events					
SS 2019	2511602	Strategic Management of Information Technology	2 SWS	Lecture (V)	Wolf
SS 2019	2511603	Übungen zu Strategisches Management der betrieblichen Informationsverarbeitung	1 SWS	Practice (Ü)	Wolf
Exams					
WS 18/19	7900030	Strategic Management of Information Technology		Prüfung (PR)	
SS 2019	7900034	Strategic Management of Information Technology		Prüfung (PR)	Wolf

Competence Certificate
The assessment of this course is a written (60 min.) or (if necessary) oral examination according (30 min.) to §4(2) of the examination regulation.

Prerequisites
None

Below you will find excerpts from events related to this course:

V Strategic Management of Information Technology

2511602, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The following topics will be covered: strategic planing of ICT, architecture of ICT, overall planning of ICT, outsourcing, operation and controlling of ICT.

Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995
- Heinrich, L. J., Burgholzer, P.: Informationsmanagement, Planung, Überwachung, Steuerung d. Inform.-Infrastruktur. Oldenbourg, München 1990
- Nolan, R.: Managing the crises in data processing. Harvard Business Review, Vol. 57, Nr. 2 1979
- Österle, H. et al.: Unternehmensführung und Informationssystem. Teubner, Stuttgart 1992
- Thome, R.: Wirtschaftliche Informationsverarbeitung. Verlag Franz Vahlen, München 1990

T 7.390 Course: Strategic Transport Planning [T-BGU-103426]

Responsible: Volker Waßmuth
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6232808	Strategische Verkehrsplanung	2 SWS	Lecture (V)	Waßmuth
Exams					
WS 18/19	8240103426	Strategic Transport Planning		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.391 Course: Strategy and Management Theory: Developments and “Classics” [T-WIWI-106190]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103119 - Strategie und Management: Fortgeschrittene Themen
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Irregular	1

Events					
WS 18/19	2577922	Strategy and Management Theory: Developments and "Classics"	2 SWS	Seminar (S)	Lindstädt, Klopfer, Graf
SS 2019	2577923	Workshop aktuelle Themen Strategie und Management (Master)	2 SWS	Seminar (S)	Lindstädt
Exams					
WS 18/19	7900120	Strategy and Management Theory: Developments and “Classics”		Prüfung (PR)	Lindstädt

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Annotation
This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the winter term 2017/18.

Below you will find excerpts from events related to this course:

V Strategy and Management Theory: Developments and "Classics"

2577922, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Notes
This course is admission restricted. If you werealready admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

Learning Content
In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

Workload
The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

V **Workshop aktuelle Themen Strategie und Management (Master)** **Seminar (S)**
2577923, SS 2019, 2 SWS, Open in study portal

Notes
This course is admission restricted. If you werealready admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

Learning Content
In this lecture, students discuss and evaluate models in the field of strategic management with a focus on applicability and theory based limitations. Critical examination of current research results will be a substantial part of this course.

Workload
The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

T 7.392 Course: Structural and Phase Analysis [T-MACH-102170]

Responsible: Dr.-Ing. Susanne Wagner
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2125763	Structural and phase analysis	2 SWS	Lecture (V)	Wagner, Hinterstein
Exams					
WS 18/19	76-T-MACH-102170	Structural and Phase Analysis		Prüfung (PR)	Wagner
SS 2019	76-T-MACH-102170	Structural and Phase Analysis		Prüfung (PR)	Wagner

Competence Certificate
Oral examination

Prerequisites
none

Below you will find excerpts from events related to this course:

V Structural and phase analysis

2125763, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
The course gives an overview to generation and detection of x-rays as well as their interaction with matter. It provides an introduction to crystallography and describes modern measurement and analysis methods of x-ray diffraction.

It is arranged in the following units:

- Generation and properties of X-Ray's
- Crystallography
- Fundamentals and application of different measuring methods
- Qualitative and quantitative phase analysis
- Texture analysis (pole figures)
- Residual stress measurements

Workload
regular attendance: 30 hours

self-study: 90 hours

Literature

1. Moderne Röntgenbeugung - Röntgendiffraktometrie für Materialwissenschaftler, Physiker und Chemiker, Spieß, Lothar / Schwarzer, Robert / Behnken, Herfried / Teichert, Gerd B.G. Teubner Verlag 2005
2. H. Krischner: Einführung in die Röntgenfeinstrukturanalyse. Vieweg 1990.
3. B.D. Cullity and S.R. Stock: Elements of X-ray diffraction. Prentice Hall New Jersey, 2001.

T 7.393 Course: Structural Ceramics [T-MACH-102179]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each summer term	1

Events					
SS 2019	2126775	Structural Ceramics	2 SWS	Lecture (V)	Hoffmann
Exams					
WS 18/19	76-T-MACH-102179	Structural Ceramics		Prüfung (PR)	Hoffmann, Wagner, Schell
SS 2019	76-T-MACH-102179	Structural Ceramics		Prüfung (PR)	Hoffmann, Wagner, Schell

Competence Certificate
Oral examination, 20 min

Prerequisites
none

Below you will find excerpts from events related to this course:

V Structural Ceramics
2126775, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:
Slides for the lecture:
available under http://www.iam.kit.edu/km

Learning Content
The lecture gives an overview on structure and properties of the technical relevant structural ceramics silicon nitride, silicon carbide, alumina, zirconia, boron nitride and fibre-reinforced ceramics. All types of structural ceramics will be discussed in detail in terms of preparation methods of the raw materials, shaping techniques, densification, microstructural development, mechanical properties and application fields.

Annotation
The course will not take place every year.

Workload
regular attendance: 21 hours
self-study: 99 hours

Literature
W.D. Kingery, H.K. Bowen, D.R. Uhlmann, "Introduction to Ceramics", John Wiley & Sons, New York, (1976)

E. Dörre, H. Hübner, "Aluminia", Springer Verlag Berlin, (1984)

M. Barsoum, "Fundamentals of Ceramics", McGraw-Hill Series in Material Science and Enginewering (2003)

T 7.394 Course: Superhard Thin Film Materials [T-MACH-102103]

Responsible: Prof. Dr. Sven Ulrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	2

Events					
WS 18/19	2177618	Superhard Thin Film Materials	2 SWS	Lecture (V)	Ulrich
Exams					
WS 18/19	76-T-MACH-102103	Superhard Thin Film Materials		Prüfung (PR)	Ulrich

Competence Certificate
oral examination (ca. 30 Minuten)

Prerequisites
none

Below you will find excerpts from events related to this course:

V Superhard Thin Film Materials

2177618, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Introduction

Basics

Plasma diagnostics

Particle flux analysis

Sputtering and ion implantation

Computer simulations

Properties of materials, thin film deposition technology,
thin film analysis and modelling of superhard materials

Amorphous hydrogenated carbon

Diamond like carbon

Diamond

Cubic Boronnitride

Materials of the system metall-boron-carbon-nitrogen-silicon

Workload
regular attendance: 22 hours
self-study: 98 hours

Literature
G. Kienel (Ed.): Vakuumbeschichtung 1 - 5, VDI Verlag, Düsseldorf, 1994

Copies with figures and tables will be distributed

T 7.395 Course: Supplementary Claim Management [T-BGU-103428]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	1,5	Each summer term	1

Events					
SS 2019	6241811	Nachtragsmanagement	1 SWS	Lecture (V)	Haghsheno, Pietsch
Exams					
WS 18/19	8240103428	Supplementary Claim Management		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.396 Course: Supply Chain Management [T-MACH-105181]

Responsible: Dr.-Ing. Knut Alicke
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	6	Each winter term	1

Events					
WS 18/19	2117062	Supply chain management	3 SWS	Lecture (V)	Alicke
WS 18/19	2117063	Übungen zu 'Supply chain management ' (mach und wiwi)	1 SWS	Practice (Ü)	Alicke
Exams					
WS 18/19	76-T-MACH-105181	Supply Chain Management		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 Supply chain management

2117062, WS 18/19, 3 SWS, Open in study portal — **Lecture (V)**

Description
Media:
presentations

Learning Content

- Bullwhip-Effect, Demand Planning & Forecasting
- Conventional planning processes (MRP + MRPII)
- Stock keeping strategy
- Data acquisition and analysis
- Design for logistics (Postponement, Mass Customization, etc.)
- Logistic partnerships (VMI, etc.)
- Distribution structures (central vs. distributed, Hub&Spoke)
- SCM-metrics (performance measurement) e-business
- Special sectors as well as guest lectures

Workload
regular attendance: 42 hours
self-study: 138 hours

Literature
Alicke, K.: Planung und Betrieb von Logistiknetzwerken

Simchi-Levi, D., Kaminsky, P.: Designing and Managing the Supply Chain

Goldratt, E., Cox, J.: The Goal

T 7.397 Course: Supply Chain Management in the Automotive Industry [T-WIWI-102828]

Responsible: Tilman Heupel
Hendrik Lang

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each winter term	1

Events					
WS 18/19	2581957	Supply Chain Management in the automotive industry	2 SWS	Lecture (V)	Lang, Heupel
Exams					
WS 18/19	7981957	Supply Chain Management in the Automotive Industry		Prüfung (PR)	Schultmann

Competence Certificate
The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Supply Chain Management in the automotive industry

2581957, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content

- Automotive industry significance
- The automotive supply chain
- Adding value structures of the automotive supply chain and mastering of the production systems as factors of success in the SCM
- Strategic procurement logistics
- Risk management
- Quality engineering and management in the automotive supply chain
- Cost engineering and management in the automotive supply chain
- Purchasing (Supplier selection, contract management)
- Performance measurement of the supply chain / organization

Annotation
None.

Workload
The total workload for this course is approximately 105.0 hours. For further information see German version.

Literature
Will be announced in the course.

T 7.398 Course: Supply Chain Management in the Process Industry [T-WIWI-102860]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-102805 - Service Operations
M-WIWI-104899 - Operations Research

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2550494	Supply Chain Management in the Process Industry	3 SWS	Lecture / Practice (VÜ)	Blackburn
Exams					
WS 18/19	7900266	Supply Chain Management in the Process Industry		Prüfung (PR)	Nickel

Competence Certificate
The assessment is a 60 minutes written examination (according to §4(2), 1 of the examination regulation) (individual grading), case study presentation by student teams (team grading) and classroom participation (individual grading). The examination is held in the term of the lecture.

Prerequisites
None

Recommendation
Basic knowledge as conveyed in the module Introduction to Operations Research is assumed.
Advanced knowledge of Operations Research (e.g., as conveyed in the lectures Facility Location and Strategic SCM, Tactical and operational SCM) is recommended.

Annotation
The number of participants is restricted due to the execution of interactive case studies and the resulting examination effort. Due to these capacity restrictions, registration before course start is required according to the information on the course website. The course is planned to be held 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 Supply Chain Management in the Process Industry

2550494, WS 18/19, 3 SWS, Open in study portal — **Lecture / Practice (VÜ)**

Learning Content
The course "Supply Chain Management in the Process Industry" covers fundamental concepts in the field of supply chain management with special focus on process industry. Strategic, planning and operational topics within the end-to-end supply chain are examined, covering relevant approaches in design, processes and performance measurement. Additional focus within the course is on showing the interdisciplinary linkages SCM has with information systems, performance management, project management, risk management and sustainability management. The course is enriched by various insights from the world´s leading chemical company BASF, provided by executive management as real life examples and cases.

Annotation
The number of participants is restricted due to the execution of interactive case studies and the resulting examination effort. Due to these capacity restrictions, registration before course start is required according to the information on the course website. The course is planned to be held 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

- Chopra, S./Meindl, P.: Supply Chain Management – Strategy, Planning, & Operations, 4th edition, Upper Saddle River, 2009.
- Various case studies, which will be provided during the course

T 7.399 Course: Supply Chain Management with Advanced Planning Systems [T-WIWI-102763]

Responsible: Claus J. Bosch
Dr. Mathias Göbelt

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101412 - Industrielle Produktion III
M-WIWI-101471 - Industrielle Produktion II
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3,5	Each summer term	1

Events					
SS 2019	2581961	Supply Chain Management with Advanced Planning Systems	2 SWS	Lecture (V)	Göbelt, Bosch
Exams					
WS 18/19	7981961	Supply Chain Management with Advanced Planning Systems		Prüfung (PR)	Schultmann

Competence Certificate
The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Supply Chain Management with Advanced Planning Systems

2581961, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
1. **Introduction to Supply Chain Management**
1.1. Supply Chain Management Fundamentals
1.2. Supply Chain Management Analytics
2. Structure of Advanced Planning Systems
3. SAP SCM
3.1. Introduction / SCM Solution Map
3.2. Demand Planning
3.3. Supply Network Planning
3.4. Production Planning and Detailed Scheduling
3.5. Deployment
3.6. Transportation Planning and Vehicle Scheduling
3.7. [Optional] Global Available to Promise
4. SAP SCM in Practice
4.1. Success Stories
4.2. SAP Implementation Methodology

Annotation
This lecture has 3,5 Credits since summer term 2014.

Workload
The total workload for this course is approximately 105 hours. For further information see German version.

Literature
will be announced in the course

T 7.400 Course: Systematic Materials Selection [T-MACH-100531]

Responsible: Dr.-Ing. Stefan Dietrich
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	3

Events					
SS 2019	2174576	Systematic Materials Selection	3 SWS	Lecture (V)	Dietrich
SS 2019	2174577	Übungen zu 'Systematische Werkstoffauswahl'	1 SWS	Practice (Ü)	Dietrich, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-100531	Systematic Materials Selection		Prüfung (PR)	Dietrich
SS 2019	76-T-MACH-100531	Systematic Materials Selection		Prüfung (PR)	Dietrich

Competence Certificate
The assessment is carried out as a written exam of 2 h.

Prerequisites
None.

Recommendation
It is strongly recommended to pass the two courses "Materials Science I" (T-MACH-102078) and "Materials Science II" (T-MACH-102079).

Below you will find excerpts from events related to this course:

V Systematic Materials Selection

2174576, SS 2019, 3 SWS, Open in study portal — **Lecture (V)**

Learning Content
Important aspects and criteria of materials selection are examined and guidelines for a systematic approach to materials selection are deeloped. The following topics are covered:

- Information and introduction
- Necessary basics of materials
- Selected methods / approaches of the material selection
- Examples for material indices and materials property charts
- Trade-off and shape factors
- Sandwich materials and composite materials
- High temperature alloys
- Regard of process influences
- Material selection for production lines
- Incorrect material selection and the resulting consequences
- Abstract and possibility to ask questions

Workload
The workload for the lecture is 150 h per semester and consists of the presence during the lecture (30 h) as well as preparation and rework time at home (120 h).

Literature
Lecture notes; Problem sheets; Textbook: M.F. Ashby, A. Wanner (Hrsg.), C. Fleck (Hrsg.);
Materials Selection in Mechanical Design: Das Original mit Übersetzungshilfen
Easy-Reading-Ausgabe, 3. Aufl., Spektrum Akademischer Verlag, 2006
ISBN: 3-8274-1762-7

T 7.401 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-102832 - Operations Research im Supply Chain Management
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 7.402 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 7.403 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 7.404 Course: Technical Conditions Met [T-WIWI-106623]

Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101453 - Angewandte strategische Entscheidungen

Type	Credits	Recurrence	Version
Studienleistung	0	Each term	1

Competence Certificate
This module element is intended to record the Bachelor-examination "Introduction to Game Theory". In the master module M-WIWI-101453 "Applied Strategic Decisions", this means that the obligatory course "Advanced Game Theory" is not required.

Prerequisites
None

T 7.405 Course: Technologies for Innovation Management [T-WIWI-102854]

Responsible: Dr. Daniel Jeffrey Koch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each winter term	2

Events					
WS 18/19	2545106	Technologien für das Innovationsmanagement	2 SWS	Block (B)	Koch
Exams					
WS 18/19	7900239	Technologies for Innovation Management		Prüfung (PR)	Weissenberger-Eibl

Competence Certificate
Presentation and individual paper (ca. 15 pages) as Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
Prior attendance of the course Innovationsmanagement: Konzepte, Strategien und Methoden [2545015] is recommended.

Below you will find excerpts from events related to this course:

V Technologien für das Innovationsmanagement

2545106, WS 18/19, 2 SWS, Open in study portal **Block (B)**

Learning Content
The seminar "Technologies for Innovation Management" will focus on the early phase or fuzzy front end in innovation management. Technologies can be of great importance here, above all in the supply of information. In globally distributed R & D organizations, it is necessary to collect as much information as possible on new technological developments in the early phase of the innovation process. Information and communication technologies can be supported.

Literature
Will be announced in the first session.

T 7.406 Course: Technology Assessment [T-WIWI-102858]

Responsible: Dr. Daniel Jeffrey Koch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101507 - Innovationsmanagement
M-WIWI-101507 - Innovationsmanagement
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Competence Certificate
Non exam assessment (§4 (2), 3 SPO 2007) respectively alternative exam assessments (§4(2), 3 SPO 2015).

Prerequisites
None

Recommendation
Prior attendance of the course*Innovation Management*[2545015] is recommended.

Annotation
See German version.

T 7.407 Course: Telecommunication and Internet Economics [T-WIWI-102713]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101406 - Netzwerkökonomie
M-WIWI-101409 - Electronic Markets
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2561232	Telecommunication and Internet Economics	2 SWS	Lecture (V)	Mitusch
WS 18/19	2561233	Übung zu Telekommunikations- und Internetökonomie	1 SWS	Practice (Ü)	Mitusch
Exams					
WS 18/19	7900270	Telecommunication and Internet Economics		Prüfung (PR)	Mitusch

Competence Certificate
Result of success is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Prerequisites
None

Recommendation
Basic knowledge and skills of microeconomics from undergraduate studies (bachelor's degree) are expected.

Particularly helpful but not necessary: Industrial Economics. Prior attendance of the lecture „Competition in Networks" [26240] or "Industrial Organisation" is helpful in any case but not considered a formal precondition. The english taught course "Communications Economics" is complementary and recommendet for anyone interested in the sector.

Below you will find excerpts from events related to this course:

V Telecommunication and Internet Economics

2561232, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
Among the network sectors the telecommunication and internet sector is the most dynamic one and the one with and highest variety of phenomena. Problems of natural monopoly still exist in some parts. But there is also competition, not only at the service level but also at the infrastructural level. Both levels are characterized by (vertical) quality differentiations and by high technology dynamics. What should the regulation of this sector look like? How should the mutual network access prices of two telecommunication providers be regulated and how can regulators set incentives for infrastructure investments?

The internet is a free market par excellence, because everybody can open internet businesses without high entry costs. Why then can a company like ebay dominate the market for internet-auction platforms so strongly? The causes of market concentration on the internet will be analyzed. So will be the economic implications of the Next Generations Networks.

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
J.-J. Laffont, J. Tirole (2000): Competition in Telecommunications, MIT Press.

Zarnekow, Wulf, Bronstaedt (2013): Internetwirtschaft: Das Geschäft des Datentransports im Internet.

Further literature will be provided during the lecture

T 7.408 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 7.409 Course: Tendering, Planning and Financing in Public Transport [T-BGU-101005]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each term	1

Events					
SS 2019	6232807	Wettbewerb, Planung und Finanzierung im ÖPNV	2 SWS	Lecture (V)	Pischon
Exams					
WS 18/19	8245101005	Tendering, Planning and Financing in Public Transport		Prüfung (PR)	Vortisch

Competence Certificate
oral exam, appr. 20 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.410 Course: Theory of Endogenous Growth [T-WIWI-102785]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101478 - Innovation und Wachstum
M-WIWI-101496 - Wachstum und Agglomeration
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Exams				
WS 18/19	7900078	Theory of Endogenous Growth	Prüfung (PR)	Ott

Competence Certificate
The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Students will be given the opportunity of writing and presenting a short paper during the lecture time to achieve a bonus on the exam grade. If the mandatory credit point exam is passed, the awarded bonus points will be added to the regular exam points. A deterioration is not possible by definition, and a grade does not necessarily improve, but is very likely to (not every additional point improves the total number of points, since a grade can not become better than 1). The voluntary elaboration of such a paper can not countervail a fail in the exam.

Prerequisites
None

Recommendation
Basic knowledge of micro- and macroeconomics is assumed, as taught in the courses Economics I [2600012], and Economics II [2600014]. In addition, an interest in quantitative-mathematical modeling is required.

Annotation
Due to the research semester of Prof. Dr. Ingrid Ott, the course is not offered in the winter term 2018/19.

T 7.411 Course: Tires and Wheel Development for Passenger Cars [T-MACH-102207]

Responsible: Dr.-Ing. Günter Leister
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101265 - Fahrzeugentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2114845	Tires and Wheel Development for Passenger Cars	2 SWS	Lecture (V)	Leister
Exams					
WS 18/19	76-T-MACH-102207	Tires and Wheel Development for Passenger Cars		Prüfung (PR)	Leister
SS 2019	76-T-MACH-102207	Tires and Wheel Development for Passenger Cars		Prüfung (PR)	Leister

Competence Certificate
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
none

Below you will find excerpts from events related to this course:

V Tires and Wheel Development for Passenger Cars

2114845, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content

1. The role of the tires and wheels in a vehicle
2. Geometrie of Wheel and tire, Package, load capacity and endurance, Book of requirement
3. Mobility strategy, Minispare, runflat systems and repair kit.
4. Project management: Costs, weight, planning, documentation
5. Tire testing and tire properties
6. Wheel technology incuding Design and manifacturing methods, Wheeltesting
7. Tire presssure: Indirect and direct measuring systems
8. Tire testing subjective and objective

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
Manuscript to the lecture

T 7.412 Course: Topics in Experimental Economics [T-WIWI-102863]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101505 - Experimentelle Wirtschaftsforschung
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Irregular	1

Events					
WS 18/19	2520405	Topics in Experimental Economics	SWS	Seminar (S)	Reiß, Hofmann, Mitarbeiter
Exams					
WS 18/19	79191ee	Seminar Topics in Experimental Economics		Prüfung (PR)	Reiß

Competence Certificate
The assessment consists of a written exam (following §4(2), 1 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge of Experimental Economics is assumed. Therefore, it is strongly recommended to attend the course Experimental Economics beforehand.

Annotation
The course is offered in summer 2020 for the next time, not in summer 2018.

Below you will find excerpts from events related to this course:

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.

T 7.413 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 7.414 Course: Traffic Engineering [T-BGU-101798]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6232703	Straßenverkehrstechnik	2 SWS	Lecture / Practice (VÜ)	Vortisch, Mitarbeiter/innen
Exams					
WS 18/19	8240101798	Traffic Engineering		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.415 Course: Traffic Flow Simulation [T-BGU-101800]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6232804	Simulation von Verkehr	2 SWS	Lecture / Practice (VÜ)	Vortisch, Mitarbeiter/innen
Exams					
WS 18/19	8240101800	Traffic Flow Simulation		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.416 Course: Traffic Management and Transport Telematics [T-BGU-101799]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6232802	Verkehrsmanagement und Telematik	2 SWS	Lecture / Practice (VÜ)	Vortisch
Exams					
WS 18/19	8240101799	Traffic Management and Transport Telematics		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.417 Course: Transport Economics [T-WIWI-100007]

Responsible: Prof. Dr. Kay Mitusch
Dr. Eckhard Szimba

Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101406 - Netzwerkökonomie
M-WIWI-101468 - Umwelt- und Ressourcenökonomie
M-WIWI-101485 - Verkehrsinfrastrukturpolitik und regionale Entwicklung
M-WIWI-104908 - Volkswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each summer term	1

Events					
SS 2019	2560230	Transport Economics	SWS	Lecture (V)	Mitusch, Szimba
SS 2019	2560231	Übung zu Transportökonomie	SWS	Practice (Ü)	Mitusch, Wisotzky, Szimba
Exams					
WS 18/19	7900269	Transport Economics		Prüfung (PR)	Mitusch

Competence Certificate
The assessment is made by a 60 minutes written examination during the semester break (according to §4(2), 1 ERSC). Examination is offered every semester and can be retried at any regular examination date.

Below you will find excerpts from events related to this course:

V Transport Economics

2560230, SS 2019, SWS, Open in study portal — **Lecture (V)**

Learning Content
The course shall provide an overview of transport economics. It will be demonstrated, using new microeconomic models, which impacts regulation and pricing in transport have on the economic actions of individuals and logisticans and which benefits and costs apply. The following topics will be discussed:

- demand and supply in transport
- empirical analysis of transport demand
- assessment of transport infrastructure projects
- external effects in transport
- transport policy
- cost structures of transport infrastructure
- Project evaluation from the perspective of the public sector

Workload
The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature
Will be announced in the lecture.
(for literature to prepare the lecture - see additional literature)

Literature:

Aberle, G: Transportwirtschaft: einzelwirtschaftliche und gesamtwirtschaftliche Grundlagen München; Wien: Oldenbourg, 2003.

Blauwens, G., De Baere, P. and Van der Voorde, E. (2006): Transport Economics.

Frerich, J; Müller, G: Europäische Verkehrspolitik, Landverkehrspolitik München; Wien: Oldenbourg, 2004.

Dasgupta, A, Pearce, D (1972): Cost-Benefit Analysis, MacMillan, London.

Europäische Kommission (2008): Guide to Cost Benefit Analysis of Investment Projects, online unter http://ec.europa.eu/regional_policy/sources/Ben-Akiva, M., Meerseman, H., and Van de Voorde, E. (2008): Recent developments in transport modelling: Lessons for the freight sector.

Ortúzar, J. d. D. and Willumsen, L. (1990): Modelling Transport.

T 7.418 Course: Transportation Data Analysis [T-BGU-100010]

Responsible: Dr.-Ing. Martin Kagerbauer
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101065 - Verkehrsmodellierung und Verkehrsmanagement
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6232901	Empirische Daten im Verkehrswesen	2 SWS	Lecture / Practice (VÜ)	Kagerbauer
Exams					
WS 18/19	8245100010	Transportation Data Analysis		Prüfung (PR)	Kagerbauer

Prerequisites
None

Recommendation
None

Annotation
None

T 7.419 Course: Transportation Systems [T-BGU-106610]

Responsible: Prof. Dr.-Ing. Peter Vortisch
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101064 - Grundlagen des Verkehrswesens
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each summer term	2

Events					
SS 2019	6200406	Transportation Systems	2 SWS	Lecture (V)	Vortisch
Exams					
WS 18/19	8230106610	Transportation Systems		Prüfung (PR)	Vortisch

Prerequisites
None

Recommendation
None

Annotation
None

T 7.420 Course: Tunnel Construction and Blasting Engineering [T-BGU-101846]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101110 - Verfahrenstechnik im Baubetrieb
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	6241903	Tunnelbau und Sprengtechnik	2 SWS	Lecture (V)	Haghsheno, Scheuble, Matz
Exams					
WS 18/19	8240101846	Tunnel Construction and Blasting Engineering		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.421 Course: Turnkey Construction I - Processes and Methods [T-BGU-103430]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	1,5	Each summer term	1

Events					
SS 2019	6241808	Schlüsselfertiges Bauen I	1 SWS	Lecture (V)	Teizer
Exams					
WS 18/19	8240103430	Turnkey Construction I - Processes and Methods		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.422 Course: Turnkey Construction II - Trades and Technology [T-BGU-103431]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101884 - Lean Management im Bauwesen
M-BGU-101888 - Projektmanagement im Bauwesen
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	6241809	Schlüsselfertiges Bauen II (Gewerke und Technik)	2 SWS	Lecture / Practice (VÜ)	Teizer, Denzer
Exams					
WS 18/19	8240103431	Turnkey Construction II - Trades and Technology		Prüfung (PR)	Haghsheno

Prerequisites
None

Recommendation
None

Annotation
None

T 7.423 Course: Urban Water Infrastructure and Management [T-BGU-106600]

Responsible: Dr.-Ing. Stephan Fuchs
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: M-BGU-101001 - Water Supply and Sanitation (Wasserver- und entsorgung)
M-BGU-104448 - Urban Water Technologies
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	6	Each term	2

Events					
WS 18/19	6223701	Urban Water Infrastructure and Management	4 SWS	Lecture / Practice (VÜ)	Fuchs
Exams					
WS 18/19	8244106600	Urban Water Infrastructure and Management		Prüfung (PR)	Fuchs

Competence Certificate
written exam, 60 min.

Prerequisites
none

Recommendation
none

Annotation
none

T 7.424 Course: Valuation [T-WIWI-102621]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101480 - Finance 3
M-WIWI-101482 - Finance 1
M-WIWI-101483 - Finance 2
M-WIWI-101510 - Cross-Functional Management Accounting
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4,5	Each winter term	1

Events					
WS 18/19	2530212	Valuation	2 SWS	Lecture (V)	Ruckes
WS 18/19	2530213	Übungen zu Valuation	1 SWS	Practice (Ü)	Ruckes, Scholz-Daneshgari
Exams					
WS 18/19	7900057	Valuation		Prüfung (PR)	Ruckes
SS 2019	7900072	Valuation		Prüfung (PR)	Ruckes

Competence Certificate
See German version.

Prerequisites
None

Recommendation
None

Below you will find excerpts from events related to this course:

V Valuation

2530212, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Description
Firms prosper when they create value for their shareholders and stakeholders. This is achieved by investing in projects that yield higher returns than their according cost of capital. Students are told the basic tools for firm and project valuation as well as ways to implement these tools in order to enhance a firm's value and improve its investment decisions. Among other things, the course will deal with the valuation of firms and individual projects using discounted cash flow and relative valuation approaches and the valuation of flexibility deploying real options.

Learning Content
Topics:

- Projections of cash flows
- Estimation of the cost of capital
- Valuation of the firm
- Mergers and acquisitions
- Real options

Literature
Elective Literature

Titman/Martin (2013): *Valuation - The Art and Science of Corporate Investment Decisions*, 2nd. ed. Pearson International.

T 7.425 Course: Vehicle Comfort and Acoustics I [T-MACH-105154]

Responsible: Prof. Dr. Frank Gauterin
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each winter term	1

Events					
WS 18/19	2113806	Vehicle Comfort and Acoustics I	2 SWS	Lecture (V)	Gauterin
SS 2019	2114856	Vehicle Ride Comfort & Acoustics I	2 SWS	Lecture (V)	Gauterin
Exams					
WS 18/19	76-T-MACH-105154	Vehicle Comfort and Acoustics I		Prüfung (PR)	Gauterin
SS 2019	76-T-MACH-105154	Vehicle Comfort and Acoustics I		Prüfung (PR)	Gauterin

Competence Certificate
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
Can not be combined with lecture T-MACH-102206

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102206 - Vehicle Ride Comfort & Acoustics I must not have been started.

Below you will find excerpts from events related to this course:

V Vehicle Comfort and Acoustics I

2113806, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Perception of noise and vibrations

3. Fundamentals of acoustics and vibrations

3. Tools and methods for measurement, computing, simulation and analysis of noise and vibrations

4. The relevance of tire and chasis for the acoustic and mechanical driving comfort:
phenomena, influencing parameters, types of construction, optimization of components and systems, conflict of goals, methods of development

An excursion will give insights in the development practice of a car manufacturer or a system supplier.

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
1. Michael Möser, Technische Akustik, Springer, Berlin, 2005

2. Russel C. Hibbeler, Technische Mechanik 3, Dynamik, Pearson Studium, München, 2006

3. Manfred Mitschke, Dynamik der Kraftfahrzeuge, Band B: Schwingungen, Springer, Berlin, 1997

The script will be supplied in the lectures

V Vehicle Ride Comfort & Acoustics I

2114856, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Learning Content
1. Perception of noise and vibrations

3. Fundamentals of acoustics and vibrations

3. Tools and methods for measurement, computing, simulation and analysis of noise and vibrations

4. The relevance of tire and chasis for the acoustic and mechanical driving comfort:
phenomena, influencing parameters, types of construction, optimization of components and systems, conflict of goals, methods of development

An excursion will give insights in the development practice of a car manufacturer or a system supplier.

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
1. Michael Möser, Technische Akustik, Springer, Berlin, 2005

2. Russel C. Hibbeler, Technische Mechanik 3, Dynamik, Pearson Studium, München, 2006

3. Manfred Mitschke, Dynamik der Kraftfahrzeuge, Band B: Schwingungen, Springer, Berlin, 1997

The script will be supplied in the lectures

T 7.426 Course: Vehicle Comfort and Acoustics II [T-MACH-105155]

Responsible: Prof. Dr. Frank Gauterin
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	3	Each summer term	1

Events					
SS 2019	2114825	Vehicle Comfort and Acoustics II	2 SWS	Lecture (V)	Gauterin
SS 2019	2114857	Vehicle Ride Comfort & Acoustics II	2 SWS	Lecture (V)	Gauterin
Exams					
WS 18/19	76-T-MACH-105155	Vehicle Comfort and Acoustics II		Prüfung (PR)	Gauterin
SS 2019	76-T-MACH-105155	Vehicle Comfort and Acoustics II		Prüfung (PR)	Gauterin

Competence Certificate
Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites
Can not be combined with lecture T-MACH-102205

Modeled Conditions
The following conditions have to be fulfilled:

1. The course T-MACH-102205 - Vehicle Ride Comfort & Acoustics II must not have been started.

Below you will find excerpts from events related to this course:

V Vehicle Comfort and Acoustics II

2114825, SS 2019, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Summary of the fundamentals of acoustics and vibrations

2. The relevance of road surface, wheel imperfections, springs, dampers, brakes, bearings and bushings, suspensions, engines and drive train for the acoustic and mechanical driving comfort:
- phenomena
- influencing parameters
- types of construction
- optimization of components and systems
- conflicts of goals
- methods of development

3. Noise emission of motor vehicles
- noise stress
- sound sources and influencing parameters
- legal restraints
- optimization of components and systems
- conflict of goals
- methods of development

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
The script will be supplied in the lectures.

V Vehicle Ride Comfort & Acoustics II

2114857, SS 2019, 2 SWS, Open in study portal

Lecture (V)

Notes
The lecture starts in June 2016. Exact date of beginning: see homepage of institute.

Learning Content
1. Summary of the fundamentals of acoustics and vibrations

2. The relevance of road surface, wheel imperfections, springs, dampers, brakes, bearings and bushings, suspensions, engines and drive train for the acoustic and mechanical driving comfort:
- phenomena
- influencing parameters
- types of construction
- optimization of components and systems
- conflicts of goals
- methods of development

3. Noise emission of motor vehicles
- noise stress
- sound sources and influencing parameters
- legal restraints
- optimization of components and systems
- conflict of goals
- methods of development

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature
The script will be supplied in the lectures.

T 7.427 Course: Vehicle Mechatronics I [T-MACH-105156]

Responsible: Prof. Dr.-Ing. Dieter Ammon
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101264 - Fahrzeugeigenschaften
M-MACH-101265 - Fahrzeugentwicklung
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	3	Each winter term	1

Events					
WS 18/19	2113816	Vehicle Mechatronics I	2 SWS	Lecture (V)	Ammon
Exams					
WS 18/19	76-T-MACH-105156	Vehicle Mechatronics I		Prüfung (PR)	Ammon

Competence Certificate
Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites
none

Below you will find excerpts from events related to this course:

V Vehicle Mechatronics I

2113816, WS 18/19, 2 SWS, Open in study portal **Lecture (V)**

Learning Content
1. Introduction: Mechatronics in vehicle technology
2. Vehicle Control systems
Brake- and traction controls (ABS, ASR, automated power train controls)
Active and semiactive suspension systems, active stabilizor bars
Vehicle dynamics controls, driver assistence systems
3. Modelling technology
Mechanics - multi body dynamics
Electrical and electronical systems, control systems
Hydraulics
Interdisciplinary coupled systems
4. Computer simulation technology
Numerical integration methods
Quality (validation, operating areas, accuracy, performance)
Simulator-coupling (hardware-in-the-loop, software-in-the-loop)
5. Systemdesign (example: brake control)
Demands, requirements (funktion, safety, robustness)
Problem setup (analysis - modelling - model reduction)
Solution approaches
Evaluation (quality, efficiency, validation area, concept ripeness)

Workload
regular attendance: 22,5 hours
self-study: 97,5 hours

Literature

1. Ammon, D., Modellbildung und Systementwicklung in der Fahrzeugdynamik, Teubner, Stuttgart, 1997
2. Mitschke, M., Dynamik der Kraftfahrzeuge, Bände A-C, Springer, Berlin, 1984ff
3. Miu, D.K., Mechatronics - Electromechanics and Contromechanics, Springer, New York, 1992
4. Popp, K. u. Schiehlen, W., Fahrzeugdynamik - Eine Einführung in die Dynamik des Systems Fahrzeug-Fahrweg, Teubner, Stuttgart, 1993
5. Roddeck, W., Einführung in die Mechatronik, Teubner, Stuttgart, 1997
6. Zomotor, A., Fahrwerktechnik: Fahrverhalten, Vogel, Würzburg, 1987

T 7.428 Course: Virtual Engineering I [T-MACH-102123]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101283 - Virtual Engineering A
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each winter term	2

Events					
WS 18/19	2121352	Virtual Engineering I	2 SWS	Lecture (V)	Ovtcharova
WS 18/19	2121353	Exercises Virtual Engineering I	2 SWS	Practice (Ü)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102123	Virtual Engineering I		Prüfung (PR)	Ovtcharova

Competence Certificate
Writen examination 90 min.

Prerequisites
None

Below you will find excerpts from events related to this course:

V Virtual Engineering I

2121352, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:

Lecture notes

Learning Content
The lecture communicates IT aspects required for understanding virtual product development processes. For this purpose, the focus is set on systems used in industry supporting the process chain of Virtual Engineering:

- Product Lifecycle Management is an approach for managing product related data across the entire lifecycle of the product, beginning with the concept phase until disassembling and recycling.
- CAx-systems for virtual product development allow modeling digital products regarding design, construction, manufacturing and maintenance.
- Validation systems enable the analysis of products regarding statics, dynamics, safety and manufacturing feasibility.

The objective of the lecture is to clarify the relationship between construction and validation operations by applying virtual prototypes and VR/AR/MR visualization techniques in combination with PDM/PLM-systems. This is taught by introducing each particular system in applied exercises.

V Exercises Virtual Engineering I

2121353, WS 18/19, 2 SWS, Open in study portal — **Practice (Ü)**

Learning Content
In this module, the practical application of different CAx software systems is exemplarily conducted in small groups, the main focus being the CAD systems CATIA V5 (DASSAULT SYSTEMES) and NX 5 (Siemens PLM Software).

Workload
Regular attendance: 31,5 hours, self-study: 10,5 hours

Literature
Exercise notes

T 7.429 Course: Virtual Engineering II [T-MACH-102124]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung schriftlich	4	Each summer term	2

Events					
SS 2019	2122378	Virtual Engineering II	2 SWS	Lecture (V)	Ovtcharova, Mitarbeiter
Exams					
WS 18/19	76-T-MACH-102124	Virtual Engineering II		Prüfung (PR)	Ovtcharova

Competence Certificate
Writen examination 90 min.

Prerequisites
None

Below you will find excerpts from events related to this course:

V Virtual Engineering II

2122378, SS 2019, 2 SWS, Open in study portal — **Lecture (V)**

Description
Media:

Lecture notes

Learning Content
The lecture presents the IT aspects required for understanding virtual product development processes:

- Corresponding models can be visualized in Virtual Reality Systems, from individual parts to complete assembles.
- Virtual Prototypes combine CAD-data and information about properties of components and assemblies for immersive visualization, functionality tests and functional validation in VR/AR/MR environments.
- Integrated Virtual Product Development explains product development processes from the point of view of Virtual Engineering.

The objective of this lecture is to clarify the relationship between construction and validation operations by using virtual prototypes and VR/AR/MR visualization techniques in combination with PDM/PLM-systems. This will be achieved by introducing each particular IT-system with practical-oriented exercises.

T 7.430 Course: Virtual Engineering Lab [T-MACH-106740]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2123350	Virtual Engineering Lab	SWS	Project (PRO)	Ovtcharova, Mitarbeiter
SS 2019	2123350	Virtual Engineering Lab	SWS	Project (PRO)	Ovtcharova
Exams					
WS 18/19	76-T-MACH-106740	Virtual Engineering Lab		Prüfung (PR)	Ovtcharova

Competence Certificate
Assessment of another type (graded), procedure see webpage.

T 7.431 Course: Virtual training factory 4.X [T-MACH-106741]

Responsible: Prof. Dr.-Ing. Jivka Ovtcharova
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101281 - Virtual Engineering B
M-MACH-101283 - Virtual Engineering A
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	4	Each term	1

Events					
WS 18/19	2123351	Virtual training factory 4.X	SWS	Seminar / Practical course (S/P)	Ovtcharova, Mitarbeiter
SS 2019	2123351	Virtual training factory 4.X	SWS	Seminar / Practical course (S/P)	Ovtcharova
Exams					
WS 18/19	76-T-MACH-106741	Virtual training factory 4.X		Prüfung (PR)	Ovtcharova

Competence Certificate
Assessment of another type (graded), procedure see webpage.

T 7.432 Course: Warehousing and Distribution Systems [T-MACH-105174]

Responsible: Prof. Dr.-Ing. Kai Furmans
Organisation: KIT Department of Mechanical Engineering

Part of:
M-MACH-101263 - Einführung in die Logistik
M-MACH-101277 - Materialfluss in Logistiksystemen
M-MACH-101278 - Materialfluss in vernetzten Logistiksystemen
M-MACH-101279 - Technische Logistik
M-MACH-101280 - Logistik in Wertschöpfungsnetzwerken
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 7.433 Course: Wastewater and Storm Water Treatment Facilities for Industrial Engineers [T-BGU-109051]

Responsible: Dr.-Ing. Stephan Fuchs
Dr.-Ing. Tobias Morck

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: M-BGU-104448 - Urban Water Technologies
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each term	1

Events					
SS 2019	6223801	Wastewater and Storm Water Treatment Facilities	4 SWS	Lecture / Practice (VÜ)	Fuchs, Morck

Competence Certificate
report on field trips, appr. 8-15 pages

Prerequisites
none

Recommendation
none

Annotation
none

T 7.434 Course: Water Chemistry and Water Technology I [T-CIWVT-101900]

Responsible: Prof. Dr. Harald Horn
Organisation: KIT Department of Chemical and Process Engineering
Part of: M-CIWVT-101121 - Wasserchemie und Wassertechnologie I
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	6	Each winter term	1

Events					
WS 18/19	22621	Water Technology	2 SWS	Lecture (V)	Horn
WS 18/19	22622	Excersises to Water Technology	1 SWS	Practice (Ü)	Horn, und Mitarbeiter
WS 18/19	22664	Praktikum Wassertechnologie und Wasserbeurteilung	2 SWS	Practical course (P)	Horn, Abbt-Braun, und Mitarbeiter

Prerequisites
T-CIWVT-103351 - Wasserchemisches Praktikum must be passed.

T 7.435 Course: Water Chemistry and Water Technology II [T-CIWVT-101901]

Responsible: Prof. Dr. Harald Horn
Organisation: KIT Department of Chemical and Process Engineering
Part of: M-CIWVT-101122 - Wasserchemie und Wassertechnologie II
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Version
Prüfungsleistung mündlich	9	1

Events					
WS 18/19	22603	Naturwissenschaftliche Grundlagen der Wasserbeurteilung	2 SWS	Lecture (V)	Abbt-Braun
SS 2019	22605	Membrane Technologies in Water Treatment	2 SWS	Lecture (V)	Horn, Saravia

Prerequisites
The module "Water Chemistry and Water Technology I" must be passed.

Modeled Conditions
The following conditions have to be fulfilled:

1. The module M-CIWVT-101121 - Water Chemistry and Water Technology I must have been passed.

T 7.436 Course: Web Science [T-WIWI-103112]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101472 - 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 winter term	1

Events					
WS 18/19	2511312	Web Science	2 SWS	Lecture (V)	Sure-Vetter
WS 18/19	2511313	Exercises to Web Science	1 SWS	Practice (Ü)	Sure-Vetter, Heling
Exams					
WS 18/19	7900031	Web Science		Prüfung (PR)	Sure-Vetter
SS 2019	7900032	Web Science		Prüfung (PR)	Sure-Vetter

Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None

Annotation
New course starting winter term 2015/2016.

Below you will find excerpts from events related to this course:

V Web Science
2511312, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Description
Web Science is the emergent study of the people and technologies, applications, processes and practices that shape and are shaped by the World Wide Web. Web Science aims to draw together theories, methods and findings from across academic disciplines, and to collaborate with industry, business, government and civil society, to develop our knowledge and understanding of the Web: the largest socio-technical infrastructure in human history.

The lecture provides an introduction to basic concepts of Web Science. Essential theoretical foundations, phenomena and approaches are presented and explained.

Learning Content
This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

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

- Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg, 2010 (free online book: http://www.cs.cornell.edu/home/kleinber/networks-book/)
- Thelwall, M. (2009). Social network sites: Users and uses. In: M. Zelkowitz (Ed.), Advances in Computers 76. Amsterdam: Elsevier (pp. 19-73)

V Exercises to Web Science

2511313, WS 18/19, 1 SWS, Open in study portal

Practice (Ü)

Description
Multiple exercises are held that capture the topics, held in the lecture Web Scienceand discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

Learning Content
This course aims to provide students with a basic knowledge and understanding about the structure and analysis of selected web phenomena and technologies. Topics include the small world problem, network theory, social network analysis, graph search and technologies/standards/architectures.

Workload
The total workload for the lecture Web Science is given out on the description of the lecture.

Literature

- Networks, Crowds, and Markets: Reasoning About a Highly Connected World, by David Easley and Jon Kleinberg, 2010 (free online book: http://www.cs.cornell.edu/home/kleinber/networks-book/)
- Thelwall, M. (2009). Social network sites: Users and uses. In: M. Zelkowitz (Ed.), Advances in Computers 76. Amsterdam: Elsevier (pp. 19-73)

T 7.437 Course: Welding Technology [T-MACH-105170]

Responsible: Dr. Majid Farajian
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101268 - Spezielle Werkstoffkunde
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each winter term	1

Events					
WS 18/19	2173571	Welding Technology	2 SWS	Lecture (V)	Farajian
Exams					
WS 18/19	76-T-MACH-105170	Welding Technology		Prüfung (PR)	Farajian

Competence Certificate
Oral exam, about 20 minutes

Prerequisites
none

Recommendation
Basics of material science (iron- and non-iron alloys), materials, processes and production, design.

All the relevant books of the German Welding Institute (DVS: Deutscher Verband für Schweißen und verwandte Verfahren) in the field of welding and joining is recommended.

Below you will find excerpts from events related to this course:

V Welding Technology

2173571, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
definition, application and differentiation: welding,

welding processes, alternative connecting technologies.

history of welding technology

sources of energy for welding processes

Survey: Fusion welding,

pressure welding.

weld seam preparation/design

welding positions

weldability

gas welding, thermal cutting, manual metal-arc welding

submerged arc welding

gas-shielded metal-arc welding, friction stir welding, laser beam and electron beam welding, other fusion and pressure welding processes

static and cyclic behavior of welded joints,

fatigue life improvement techniques

Workload
The workload for the lecture Welding Technology is 120 h per semester and consists of the presence during the lecture (18 h) as well as preparation and rework time at home (102 h).

Literature

Für ergänzende, vertiefende Studien gibt das

Handbuch der Schweißtechnik von J. Ruge, Springer Verlag Berlin, mit seinen vier Bänden

Band I: Werkstoffe

Band II: Verfahren und Fertigung

Band III: Konstruktive Gestaltung der Bauteile

Band IV: Berechnung der Verbindungen

einen umfassenden Überblick. Der Stoff der Vorlesung Schweißtechnik findet sich in den Bänden I und II. Einen kompakten Einblick in die Lichtbogenschweißverfahren bietet das Bändchen

Nies: Lichtbogenschweißtechnik, Bibliothek der Technik Band 57, Verlag moderne Industrie AG und Co., Landsberg / Lech

Im Übrigen sei auf die zahlreichen Fachbücher des DVS Verlages, Düsseldorf, zu allen Einzelgebieten der Fügetechnik verwiesen.

T 7.438 Course: Wildcard Key Competences Seminar 1 [T-WIWI-104680]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Studienleistung	1	1

T 7.439 Course: Wildcard Key Competences Seminar 3 [T-WIWI-104682]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Studienleistung	3	1

T 7.440 Course: Wildcard Key Competences Seminar 4 [T-WIWI-104683]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Prüfungsleistung anderer Art	1	1

T 7.441 Course: Wildcard Key Competences Seminar 5 [T-WIWI-104684]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Prüfungsleistung anderer Art	2	1

T 7.442 Course: Wildcard Key Competences Seminar 6 [T-WIWI-104685]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Prüfungsleistung anderer Art	3	1

T 7.443 Course: Wildcard Key Competences Seminar 8 [T-WIWI-105956]

Organisation: University
Part of: M-WIWI-101808 - Seminarmodul

Type	Credits	Version
Prüfungsleistung anderer Art	4	1

T 7.444 Course: Workshop Business Wargaming – Analyzing Strategic Interactions [T-WIWI-106189]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103119 - Strategie und Management: Fortgeschrittene Themen
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Each summer term	1

Events					
SS 2019	2577912	Workshop Business Wargaming - Analyzinig Strategic Interactions	2 SWS	Seminar (S)	Lindstädt

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Annotation
This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

The course is planned to be held for the first time in the summer term 2018.

Below you will find excerpts from events related to this course:

V Workshop Business Wargaming - Analyzinig Strategic Interactions

2577912, SS 2019, 2 SWS, Open in study portal **Seminar (S)**

Notes
This course is admission restricted. If you werealready admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

Learning Content
In this course, students simulate and analyze real-life conflict situations using Business Wargaming methods. The students will be able to understand the underlying structure and dynamics of various conflicts, this includes making own conclusions as well as deriving strategic recommendations.

Workload
The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

T 7.445 Course: Workshop Current Topics in Strategy and Management [T-WIWI-106188]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-103119 - Strategie und Management: Fortgeschrittene Themen
M-WIWI-104900 - Betriebswirtschaftslehre

Type	Credits	Recurrence	Version
Prüfungsleistung anderer Art	3	Irregular	1

Events					
WS 18/19	2577921	Workshop Current Topics in Strategy and Management	2 SWS	Seminar (S)	Lindstädt, Burkardt, Müller
Exams					
WS 18/19	7900171	Workshop Current Topics in Strategy and Management		Prüfung (PR)	Lindstädt

Competence Certificate
Non exam assessment (following §4(2) 3 of the examination regulation).

Prerequisites
None

Recommendation
Basic knowledge as conveyed in the bachelor module „Strategy and Organization“ is recommended.

Annotation
This course is admission restricted. If you were already admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.
The course is planned to be held for the first time in the winter term 2017/18.

Below you will find excerpts from events related to this course:

V Workshop Current Topics in Strategy and Management

2577921, WS 18/19, 2 SWS, Open in study portal **Seminar (S)**

Learning Content
In this lecture, current economic trends will be discussed from a perspective of competition analysis and corporate strategies. Using appropriate frameworks, the students will be able to analyze collectively selected case studies and derive business strategies.

Annotation
This course is admission restricted. If you werealready admitted to another course in the module “Advanced Topics in Strategy and Management” the participation at this course will be guaranteed.

Workload
The total workload for this course is approximately 90 hours.

Lecture: 15 hours

Preparation of lecture: 75 hours

Exam preparation: n/a

T 7.446 Course: X-ray Optics [T-MACH-109122]

Responsible: Dr. Arndt Last
Organisation: KIT Department of Mechanical Engineering

Part of: M-MACH-101291 - Mikrofertigung
M-MACH-101292 - Mikrooptik
M-WIWI-104907 - Ingenieurwissenschaften

Type	Credits	Recurrence	Version
Prüfungsleistung mündlich	4	Each term	1

Events					
WS 18/19	2141007	X-ray Optics	2 SWS	Lecture (V)	Last
SS 2019	2141007	Röntgenoptik	2 SWS	Lecture (V)	Last
Exams					
WS 18/19	76-T-MACH-109122	X-ray Optics		Prüfung (PR)	Last
SS 2019	76-T-MACH-109122	X-ray Optics		Prüfung (PR)	Last

Competence Certificate
oral exam (about 20 min)

Prerequisites
none

Below you will find excerpts from events related to this course:

V X-ray Optics

2141007, WS 18/19, 2 SWS, Open in study portal — **Lecture (V)**

Learning Content
The lecture covers general principles of optics as well as basics, functioning and application of reflective, refractive and diffractive X-ray optical elements and systems. Selected X-ray analytical imaging methods and the necessary optical elements are discussed including their potentials and limitations.

Annotation
Lecture dates will be fixed in agreement with the students, see institutes website.

A visit at synchrotron ANKA is possible if requested.

Workload
lecture times plus assignment to review

Literature
M. Born und E. Wolf
Principles of Optics, 7th (expanded) edition
Cambridge University Press, 2010

A. Erko, M. Idir, T. Krist und A. G. Michette
Modern Developments in X-Ray and Neutron Optics
Springer Series in Optical Sciences, Vol. 137
Springer-Verlag Berlin Heidelberg, 2008

D. Attwood
Soft X-Rays and Extreme Ultraviolet Radiation: Principles and Applications
Cambridge University Press, 1999