

Module Handbook

Industrial Engineering and Management B.Sc.

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KIT DEPARTMENT OF ECONOMICS AND MANAGEMENT



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| 7.225. Seminar in Operations Research (Bachelor) - T-WIWI-103488 | 452 |
| 7.226. Seminar in Statistics (Bachelor) - T-WIWI-103489 | 455 |
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| 7.228. Seminar: Legal Studies I - T-INFO-101997 | 457 |
| 7.229. Services Marketing and B2B Marketing - T-WIWI-102806 | 459 |
| 7.230. Simulation of Coupled Systems - T-MACH-105172 | 461 |
| 7.231. Simulation of Coupled Systems - Advance - T-MACH-108888 | 463 |
| 7.232. Social Science A (WiWi) - T-GEISTSOZ-109048 | 464 |
| 7.233. Social Science B (WiWi) - T-GEISTSOZ-109049 | 465 |
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| 7.235. Statistical Modeling of Generalized Regression Models - T-WIWI-103065 | 467 |
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| 7.237. Statistics II - T-WIWI-102738 | 470 |
| 7.238. Strategic Finance and Technoloy Change - T-WIWI-110511 | 472 |
| 7.239. Structural and Phase Analysis - T-MACH-102170 | 473 |
| 7.240. Structural Ceramics - T-MACH-102179 | 474 |
| 7.241. Supplement Applied Informatics - T-WIWI-110711 | 475 |
| 7.242. System Dynamics and Control Engineering - T-ETIT-101921 | 476 |
| 7.243. Systematic Materials Selection - T-MACH-100531 | 477 |
| 7.244. Systems of Remote Sensing, Prerequisite - T-BGU-101637 | 479 |
| 7.245. Tactical and Operational Supply Chain Management - T-WIWI-102714 | 480 |
| 7.246. Team Project Management and Technology - T-WIWI-110968 | 481 |
| 7.247. Team Project Management and Technology (BUS/ENG) - T-WIWI-110977 | 482 |

| | |
|---|-----|
| 7.248. Tires and Wheel Development for Passenger Cars - T-MACH-102207 | 483 |
| 7.249. Tutorial Global Production - T-MACH-110981 | 484 |
| 7.250. Vehicle Comfort and Acoustics I - T-MACH-105154 | 486 |
| 7.251. Vehicle Comfort and Acoustics II - T-MACH-105155 | 488 |
| 7.252. Vehicle Mechatronics I - T-MACH-105156 | 490 |
| 7.253. Virtual Reality Practical Course - T-MACH-102149 | 491 |
| 7.254. Welfare Economics - T-WIWI-102610 | 492 |

1 General information

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! In the following we would like to give you a short introduction to the most important terms and rules that are important in connection with the choice of modules, courses and examinations.

1.1 Structural elements

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).

1.2 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.

1.3 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.

1.4 General and partial examinations

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

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

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

1.5 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.

1.6 Repeating exams

Principally, a failed written exam, oral exam or alternative exam assessment can be repeated only once. If the repeat examination (including an eventually provided verbal repeat examination) will be failed as well, the examination claim is lost. A request for a second repetition has to be made in written form to the examination committee two months after losing the examination claim. A counseling interview is mandatory.

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

1.7 Examiners

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

1.8 Additional accomplishments

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

1.9 Further information

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

1.10 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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2 Study plan

The Bachelor's degree program in Industrial Engineering and Management entails a six-semester standard study period. The basic program in the first three semesters is systematically structured. In the fourth to fifth semesters, a more advanced, specialization program that can be structured depending on one's personal interests and goals is offered.

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

| | Term | Credits | Business Administration | Economics | Informatics | Operations Research | Engineering | Statistics | Mathematics | Electives | Internship Bachelor Thesis |
|------------------------|--------|---------|-------------------------------------|----------------|----------------|---------------------|--|----------------|----------------|---|----------------------------|
| Basic Program | 1 (WT) | 27 | BUS FA 4 CP BUS SMIEM 3 CP | ECON 1 5 CP | PROG 1 5 CP | | Mat. Science (MS) 1 3 CP | | MATH 1 7 CP | | |
| | 2 (ST) | 33 | BUS PEM 4 CP | ECON 2 5 CP | INFO 1 5 CP | OR 1 4,5 CP | Eng. Mech. (EM) 1 3 CP | STAT 1 5 CP | MATH 2 7 CP | | |
| | 3 (WT) | 32 | ACC 4 CP | | INFO 2 5 CP | OR 2 4,5 CP | Electr. Eng. 1 3 CP AFoE 3 CP | STAT 2 5 CP | MATH 3 7 CP | | |
| Specialization Program | 4 (ST) | 31 | | ECON | INFO | OR | | | | Seminar 3 CP | Internship 10 CP |
| | 5 (WT) | 27 | BUS 9 CP | 9 CP | 9 CP | 9 CP | ENG 9 CP | | | 2 Elective Modules (one from BUS/ENG) 9 CP + 9 CP | |
| | 6 (ST) | 30 | | | | | | | | | Bachelor Thesis 12 CP |
| | | 180 | | | | | | | | | |

Figure 2: Structure of the Bachelor's degree program in Industrial Engineering and Management SPO 2015 (recommended)

In the **basic program** (blue), the business administration, economics, informatics, operations research, engineering sciences, statistics and mathematics modules are compulsory. In the 3rd semester, one can choose between Material Transformation and Balances, Engineering Mechanics and Material Science in the engineering basic module.

In the **specialization program** (green), a module must be selected from each of the following areas: business administration, economics, informatics, operations research and engineering. As part of the mandatory courses, one seminar module (independent of the course) and two modules must be completed. One module can be selected from business administration or engineering subjects and the other from business administration, economics, informatics, operations research, engineering, statistics, law or sociology.

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

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

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

3 Qualification objectives of the Bachelor's degree in Industrial Engineering and Management

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

The economics section includes business-related topics from the financial industry, company management, information industry, production management, marketing and accounting as well as economic correlations of microeconomics and macroeconomics.

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

In the engineering field, the focus is on material and energy balances, material characterization and development, engineering mechanics and electrical engineering.

The technological area is covered by the Applied and Theoretical Computer Science. Through the comprehensive methodological basis, the graduates are in a position to acknowledge and apply specialized basic concepts, methods, models and approaches. They are also able to analyze and review economic and technological structures and processes.

Graduates can independently solve basic engineering calculations and are able to apply important mathematical concepts and methods to solve concrete tasks.

The graduates have deeper knowledge in business administration, economics, computer science, operations research and engineering. Specialization is either done in the field of business administration or engineering depending on one's wishes. Additional knowledge in statistics, law or sociology is also offered depending on one's interests. They are able to react based on this knowledge from the different subjects and disciplines. They thereby largely operate independently in economic, technical and technological topics and survey, analyze, interpret and evaluate the situations systematically.

They are able to classify specialized problems as well as model and choose appropriate methods and procedures for solving the given tasks as well as derive improvement potentials. They know how to validate, illustrate and interpret the achieved results.

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

Graduates of the Bachelor's degree in Industrial Engineering and Management master the basics of project management and are able to assume responsibility in interdisciplinary teams. They are in a position to argue and defend their position both before expert representatives and laypersons.

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

4 Key Skills

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

Soft skills

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

Enabling skills

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

Orientalional knowledge

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

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

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

5 Field of study structure

| Mandatory | |
|-----------------------------|-------|
| Preliminary Exam | |
| Bachelor Thesis | 12 CR |
| Internship | 10 CR |
| Business Administration | 24 CR |
| Economics | 19 CR |
| Informatics | 24 CR |
| Operations Research | 18 CR |
| Engineering Sciences | 21 CR |
| Mathematics | 21 CR |
| Statistics | 10 CR |
| Compulsory Elective Modules | 21 CR |

5.1 Preliminary Exam

| Mandatory | |
|---------------|-----------------------|
| M-WIWI-100950 | Preliminary Exam 0 CR |

5.2 Bachelor Thesis

Credits
12

| Mandatory | |
|---------------|------------------------------|
| M-WIWI-101601 | Module Bachelor Thesis 12 CR |

5.3 Internship

Credits
10

| Mandatory | |
|---------------|------------------|
| M-WIWI-101419 | Internship 10 CR |

5.4 Business Administration

Credits
24

| Mandatory | | |
|---|---|------|
| M-WIWI-101494 | Fundamentals of Business Administration 1 | 7 CR |
| M-WIWI-101578 | Fundamentals of Business Administration 2 | 8 CR |
| Election block: Specialisation Program Business Administration (at least 9 credits) | | |
| M-WIWI-101467 | Design, Construction and Sustainability Assessment of Buildings | 9 CR |
| M-WIWI-101498 | Management Accounting | 9 CR |
| M-WIWI-101434 | eBusiness and Service Management | 9 CR |
| M-WIWI-101402 | eFinance | 9 CR |
| M-WIWI-101464 | Energy Economics | 9 CR |
| M-WIWI-101435 | Essentials of Finance | 9 CR |
| M-WIWI-102752 | Fundamentals of Digital Service Systems | 9 CR |
| M-WIWI-101424 | Foundations of Marketing | 9 CR |
| M-WIWI-101437 | Industrial Production I | 9 CR |
| M-WIWI-104911 | Information Systems & Digital Business: Interaction | 9 CR |
| M-WIWI-104912 | Information Systems & Digital Business: Platforms | 9 CR |
| M-WIWI-104913 | Information Systems & Digital Business: Servitization | 9 CR |
| M-WIWI-101513 | Human Resources and Organizations | 9 CR |
| M-WIWI-101466 | Real Estate Management | 9 CR |
| M-WIWI-101425 | Strategy and Organization | 9 CR |
| M-WIWI-101465 | Topics in Finance I | 9 CR |
| M-WIWI-101423 | Topics in Finance II | 9 CR |
| M-WIWI-105482 | Machine Learning and Data Science <small>neu</small> | 9 CR |

5.5 Economics

Credits
19

| Mandatory | | |
|---|--------------------------------|-------|
| M-WIWI-101398 | Introduction to Economics | 10 CR |
| Election block: Specialisation Program Economics (at least 9 credits) | | |
| M-WIWI-101499 | Applied Microeconomics | 9 CR |
| M-WIWI-101403 | Public Finance | 9 CR |
| M-WIWI-101599 | Statistics and Econometrics | 9 CR |
| M-WIWI-105414 | Statistics and Econometrics II | 9 CR |
| M-WIWI-101668 | Economic Policy I | 9 CR |
| M-WIWI-101501 | Economic Theory | 9 CR |

5.6 Informatics

Credits
24

| Mandatory | | |
|---|-----------------------------|-------|
| M-WIWI-101417 | Foundations of Informatics | 10 CR |
| M-WIWI-101581 | Introduction to Programming | 5 CR |
| Election block: Specialisation Program Informatics (at least 9 credits) | | |
| M-WIWI-105112 | Applied Informatics | 9 CR |

5.7 Operations Research

Credits
18

| Mandatory | | |
|---|-------------------------------------|------|
| M-WIWI-101418 | Introduction to Operations Research | 9 CR |
| Election block: Specialisation Program Operations Research (1 item) | | |
| M-WIWI-101413 | Applications of Operations Research | 9 CR |
| M-WIWI-101414 | Methodical Foundations of OR | 9 CR |
| M-WIWI-103278 | Optimization under Uncertainty | 9 CR |

5.8 Engineering Sciences

Credits
21

| Mandatory | | |
|--|---|------|
| M-ETIT-101155 | Electrical Engineering | 3 CR |
| M-MACH-101259 | Engineering Mechanics | 3 CR |
| M-WIWI-101839 | Additional Fundamentals of Engineering | 3 CR |
| M-MACH-101260 | Materials Science | 3 CR |
| Election block: Specialisation Program Engineering Sciences (at least 9 credits) | | |
| M-WIWI-101404 | Extracurricular Module in Engineering | 9 CR |
| M-MACH-101274 | Rail System Technology | 9 CR |
| M-WIWI-104838 | Introduction to Natural Hazards and Risk Analysis | 9 CR |
| M-ETIT-102379 | Power Network | 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-BGU-101004 | Fundamentals of Construction | 9 CR |
| M-MACH-101272 | Integrated Production Planning | 9 CR |
| M-MACH-105298 | Logistics and Supply Chain Management | 9 CR |
| M-MACH-101299 | Mechanical Design | 9 CR |
| M-MACH-101277 | Material Flow in Logistic Systems | 9 CR |
| M-MACH-101287 | Microsystem Technology | 9 CR |
| M-MACH-101267 | Mobile Machines | 9 CR |
| M-BGU-101067 | Mobility and Infrastructure | 9 CR |
| M-MACH-101270 | Product Lifecycle Management | 9 CR |
| M-ETIT-101156 | Control Engineering | 9 CR |
| M-MACH-101279 | Technical Logistics | 9 CR |
| M-MACH-101275 | Combustion Engines I | 9 CR |
| M-MACH-101303 | Combustion Engines II | 9 CR |
| M-MACH-101284 | Specialization in Production Engineering | 9 CR |
| M-MACH-101261 | Emphasis in Fundamentals of Engineering | 9 CR |
| M-MACH-101262 | Emphasis Materials Science | 9 CR |
| M-MACH-101286 | Machine Tools and Industrial Handling | 9 CR |

5.9 Mathematics**Credits**
21

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

5.10 Statistics**Credits**
10

| Mandatory | | |
|---------------|----------------------------|-------|
| M-WIWI-101432 | Introduction to Statistics | 10 CR |

5.11 Compulsory Elective Modules

Credits
21

Election notes

Within the scope of the elective compulsory area, the seminar module (independent of subject) and two modules are to be taken. One module must be chosen from the subjects Business Administration or Engineering Sciences, the other from the subjects Business Administration, Economics, Informatics, Operations Research, Engineering Sciences, Statistics, Law or Sociology.

Election regulations

Elections in this field must be complete.

| Mandatory | | |
|---|---|------|
| M-WIWI-101816 | Seminar Module | 3 CR |
| Election block: Business Administration oder Engineering Sciences (9 credits) | | |
| M-WIWI-101404 | Extracurricular Module in Engineering | 9 CR |
| M-MACH-101274 | Rail System Technology | 9 CR |
| M-WIWI-101467 | Design, Construction and Sustainability Assessment of Buildings | 9 CR |
| M-WIWI-101498 | Management Accounting | 9 CR |
| M-WIWI-101460 | CRM and Service Management | 9 CR |
| M-WIWI-101434 | eBusiness and Service Management | 9 CR |
| M-WIWI-101402 | eFinance | 9 CR |
| M-WIWI-104838 | Introduction to Natural Hazards and Risk Analysis | 9 CR |
| M-ETIT-102379 | Power Network | 9 CR |
| M-ETIT-101165 | Energy Generation and Network Components | 9 CR |
| M-WIWI-101464 | Energy Economics | 9 CR |
| M-WIWI-101435 | Essentials of Finance | 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-WIWI-102752 | Fundamentals of Digital Service Systems | 9 CR |
| M-BGU-101004 | Fundamentals of Construction | 9 CR |
| M-WIWI-101424 | Foundations of Marketing | 9 CR |
| M-WIWI-101437 | Industrial Production I | 9 CR |
| M-WIWI-104911 | Information Systems & Digital Business: Interaction | 9 CR |
| M-WIWI-104912 | Information Systems & Digital Business: Platforms | 9 CR |
| M-WIWI-104913 | Information Systems & Digital Business: Servitization | 9 CR |
| M-MACH-101272 | Integrated Production Planning | 9 CR |
| M-MACH-105298 | Logistics and Supply Chain Management | 9 CR |
| M-MACH-101299 | Mechanical Design | 9 CR |
| M-MACH-101277 | Material Flow in Logistic Systems | 9 CR |
| M-MACH-101287 | Microsystem Technology | 9 CR |
| M-MACH-101267 | Mobile Machines | 9 CR |
| M-BGU-101067 | Mobility and Infrastructure | 9 CR |
| M-WIWI-101513 | Human Resources and Organizations | 9 CR |
| M-MACH-101270 | Product Lifecycle Management | 9 CR |
| M-WIWI-101466 | Real Estate Management | 9 CR |
| M-ETIT-101156 | Control Engineering | 9 CR |
| M-WIWI-101425 | Strategy and Organization | 9 CR |
| M-WIWI-101421 | Supply Chain Management | 9 CR |
| M-WIWI-105447 | Team Project Management and Technology (BUS/ENG) neu | 9 CR |
| M-MACH-101279 | Technical Logistics | 9 CR |

| | | |
|--|---|------|
| M-WIWI-101465 | Topics in Finance I | 9 CR |
| M-WIWI-101423 | Topics in Finance II | 9 CR |
| M-WIWI-101422 | Specialization in Customer Relationship Management | 9 CR |
| M-MACH-101261 | Emphasis in Fundamentals of Engineering | 9 CR |
| M-MACH-101275 | Combustion Engines I | 9 CR |
| M-MACH-101303 | Combustion Engines II | 9 CR |
| M-MACH-101284 | Specialization in Production Engineering | 9 CR |
| M-MACH-101262 | Emphasis Materials Science | 9 CR |
| M-MACH-101286 | Machine Tools and Industrial Handling | 9 CR |
| Election block: Business Administration (at most 9 credits) | | |
| M-WIWI-101467 | Design, Construction and Sustainability Assessment of Buildings | 9 CR |
| M-WIWI-101498 | Management Accounting | 9 CR |
| M-WIWI-101434 | eBusiness and Service Management | 9 CR |
| M-WIWI-101402 | eFinance | 9 CR |
| M-WIWI-101464 | Energy Economics | 9 CR |
| M-WIWI-101435 | Essentials of Finance | 9 CR |
| M-WIWI-102752 | Fundamentals of Digital Service Systems | 9 CR |
| M-WIWI-101424 | Foundations of Marketing | 9 CR |
| M-WIWI-101437 | Industrial Production I | 9 CR |
| M-WIWI-104911 | Information Systems & Digital Business: Interaction | 9 CR |
| M-WIWI-104912 | Information Systems & Digital Business: Platforms | 9 CR |
| M-WIWI-104913 | Information Systems & Digital Business: Servitization | 9 CR |
| M-WIWI-101513 | Human Resources and Organizations | 9 CR |
| M-WIWI-101466 | Real Estate Management | 9 CR |
| M-WIWI-101425 | Strategy and Organization | 9 CR |
| M-WIWI-101421 | Supply Chain Management | 9 CR |
| M-WIWI-101465 | Topics in Finance I | 9 CR |
| M-WIWI-101423 | Topics in Finance II | 9 CR |
| M-WIWI-105482 | Machine Learning and Data Science ^{neu} | 9 CR |
| Election block: Economics (at most 9 credits) | | |
| M-WIWI-101499 | Applied Microeconomics | 9 CR |
| M-WIWI-101403 | Public Finance | 9 CR |
| M-WIWI-101599 | Statistics and Econometrics | 9 CR |
| M-WIWI-105414 | Statistics and Econometrics II | 9 CR |
| M-WIWI-101668 | Economic Policy I | 9 CR |
| M-WIWI-101501 | Economic Theory | 9 CR |
| Election block: Informatics (at most 9 credits) | | |
| M-WIWI-101426 | Electives in Informatics | 9 CR |
| Election block: Operations Research (at most 9 credits) | | |
| M-WIWI-101413 | Applications of Operations Research | 9 CR |
| M-WIWI-101414 | Methodical Foundations of OR | 9 CR |
| M-WIWI-103278 | Optimization under Uncertainty | 9 CR |
| Election block: Engineering Sciences (at most 9 credits) | | |
| M-WIWI-101404 | Extracurricular Module in Engineering | 9 CR |
| M-MACH-101274 | Rail System Technology | 9 CR |
| M-WIWI-104838 | Introduction to Natural Hazards and Risk Analysis | 9 CR |
| M-ETIT-102379 | Power Network | 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-BGU-101004 | Fundamentals of Construction | 9 CR |
| M-MACH-101272 | Integrated Production Planning | 9 CR |
| M-MACH-105298 | Logistics and Supply Chain Management | 9 CR |
| M-MACH-101299 | Mechanical Design | 9 CR |
| M-MACH-101277 | Material Flow in Logistic Systems | 9 CR |
| M-MACH-101287 | Microsystem Technology | 9 CR |
| M-MACH-101267 | Mobile Machines | 9 CR |
| M-BGU-101067 | Mobility and Infrastructure | 9 CR |
| M-MACH-101270 | Product Lifecycle Management | 9 CR |
| M-ETIT-101156 | Control Engineering | 9 CR |
| M-MACH-101279 | Technical Logistics | 9 CR |
| M-MACH-101275 | Combustion Engines I | 9 CR |
| M-MACH-101303 | Combustion Engines II | 9 CR |
| M-MACH-101284 | Specialization in Production Engineering | 9 CR |
| M-MACH-101261 | Emphasis in Fundamentals of Engineering | 9 CR |
| M-MACH-101262 | Emphasis Materials Science | 9 CR |
| M-MACH-101286 | Machine Tools and Industrial Handling | 9 CR |
| Election block: Statistics (at most 9 credits) | | |
| M-WIWI-101599 | Statistics and Econometrics | 9 CR |
| M-WIWI-105414 | Statistics and Econometrics II | 9 CR |
| Election block: Law or Sociology (at most 9 credits) | | |
| M-INFO-105084 | Public and Civil Law | 9 CR |
| M-GEISTSOZ-101167 | Sociology/Empirical Social Research | 9 CR |
| Election block: Team Project (at most 9 credits) | | |
| M-WIWI-105440 | Team Project Management and Technology ^{neu} | 9 CR |

6 Modules

M

6.1 Module: Additional Fundamentals of Engineering [M-WIWI-101839]

Responsible: Prof. Dr.-Ing. Alexander Fidlin
Dr. Volker Gaukel
Prof. Dr. Michael Hoffmann

Organisation: KIT Department of Economics and Management

Part of: [Engineering Sciences \(mandatory\)](#)

| Credits | Recurrence | Language | Level | Version |
|---------|------------|----------|-------|---------|
| 3 | Each term | German | 3 | 4 |

| Election block: Compulsory Elective Courses (between 3 and 5 credits) | | | |
|---|--|------|-----------|
| T-MACH-102079 | Material Science II for Business Engineers | 5 CR | Hoffmann |
| T-MACH-102210 | Introduction to Engineering Mechanics II : Dynamics | 5 CR | Fidlin |
| T-CIWVT-106058 | Process Fundamentals by the Example of Food Production | 3 CR | Gaukel |
| T-ETIT-100534 | Electrical Engineering for Business Engineers, Part II | 5 CR | Menesklou |

Competence Certificate

See course description.

Competence Goal

See German version.

Prerequisites

None

Content

The module focuses on basic engineering topics related to materials science, engineering mechanics and food processing.

Annotation

The course T-ETIT-100534 "Electrical Engineering for Business Engineers, Part II" is only offered temporarily in the module.

It should be pointed out that "Material Science II for Business Engineers" and "Electrical Engineering for Business Engineers, Part II" are not offered in winter term, but only in summer term.

Workload

The total workload for this module is approximately 90 hours.

M

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

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

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

| Election block: Compulsory Elective Courses (between 1 and 2 items) | | | |
|---|---|--------|-----------|
| T-WIWI-102704 | Facility Location and Strategic Supply Chain Management | 4,5 CR | Nickel |
| T-WIWI-102714 | Tactical and Operational Supply Chain Management | 4,5 CR | Nickel |
| Election block: Supplementary Courses (at most 1 item) | | | |
| T-WIWI-102726 | Global Optimization I | 4,5 CR | Stein |
| T-WIWI-106199 | Modeling and OR-Software: Introduction | 4,5 CR | Nickel |
| T-WIWI-106545 | Optimization under Uncertainty | 4,5 CR | Rebennack |

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

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

Content

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

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

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

Recommendation

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

Annotation

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

Workload

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

M

6.3 Module: Applied Informatics [M-WIWI-105112]

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

Organisation: KIT Department of Economics and Management

Part of: Informatics (Specialisation Program Informatics)

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

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

Competence Certificate

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

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

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

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

Competence Goal

The student

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

Content

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

Workload

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

M

6.4 Module: Applied Microeconomics [M-WIWI-101499]

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
3

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

Competence Certificate

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

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

Competence Goal

Students

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

Prerequisites

None.

Content

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

Recommendation

Completion of the module Economics is assumed.

Workload

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

M

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

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Automotive Engineering (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 |
| T-MACH-102203 | Automotive Engineering I | 6 CR | Gauterin, Gießler |
| T-MACH-110796 | Python Algorithm for Vehicle Technology | 4 CR | Rhode |

Competence Certificate

The assessment is carried out as partial exams.

The partial exams consists of a written exam (90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

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

6.6 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 (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Wahlpflicht (between 1 and 2 items) | | | |
|---|---|------|--------------|
| T-MACH-102194 | Combustion Engines I | 5 CR | Koch, Kubach |
| T-MACH-105564 | Energy Conversion and Increased Efficiency in Internal Combustion Engines | 4 CR | Koch, Kubach |

Competence Certificate

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

Competence Goal

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

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

Prerequisites

None

Content

Working Principle og ICE

Characteristic Parameters

Characteristic parameters

Engine parts

Crank drive

Fuels

Gasolien engine operation modes

Diesel engine operation modes

Emissions

Fundamentals of ICE combustion

Thermodynamics of ICE

Flow field

Wall heat losses

Combsution in Gasoline and Diesel engines

Heat release calculation

Waste heat recovery

Workload

regular attendance: 62 hours

self-study: 208 hours

M

6.7 Module: Combustion Engines II [M-MACH-101303]

Responsible: Dr.-Ing. Heiko Kubach

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits
9

Recurrence
Each term

Language
German

Level
4

Version
3

| 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-105169 | Engine Measurement Techniques | 4 CR | Bernhardt |
| T-MACH-110817 | Development of hybrid drivetrains | 4 CR | Koch |
| T-MACH-110816 | Großdiesel- und -gasmotoren für Schiffsantriebe | 4 CR | Kubach |
| T-MACH-105649 | Boosting of Combustion Engines | 4 CR | Kech, Kubach |
| T-MACH-105985 | Ignition Systems | 4 CR | Toedter |

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

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

The course *Combustion Engines II* [2134131] has to be attended.

Content

Compulsory:

Supercharging and air management

Engine maps Emissions and Exhaust gas aftertreatment

Transient engine operation ECU application

Electrification and alternative powertrains

Elective:

Fuels and lubricants for ICE

Fundamentals of catalytic EGA

Analysis tools for combustion diagnostics

Engine measurement techniques

Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines

Workload

regular attendance: 62 h

self-study: 208 h

Learning type

Lecture, Tutorial

M

6.8 Module: Control Engineering [M-ETIT-101156]

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

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

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

| Mandatory | | | |
|---------------|---|------|---------|
| T-ETIT-100699 | Modelling and Identification | 4 CR | Hohmann |
| T-ETIT-101921 | System Dynamics and Control Engineering | 6 CR | Hohmann |

Competence Goal

The students

- get familiar with the basic concepts of control theory,
- learn and understand the elements, the structure and the behavior of dynamic systems,
- have insight in the problems of control and intuition about methods available to solve those problems as well in frequency domain as in time domain,
- get familiar with the basic principles and methods for the theoretical and experimental modelling of dynamic systems.

Prerequisites

Successful passing of the corresponding modules of the basic program.

Content

This module familiarizes students with the basic elements, structures and the behavior of dynamic systems. Both time continuous and time discrete models are regarded. The students gain insight into the problems of control design and methods available to solve such problems in frequency and time domain. Above that, the students learn the basic principles and methods for the theoretical and experimental modelling of dynamic systems.

M

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

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)

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

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

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

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

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

Annotation

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

Workload

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

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

M

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

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: Business Administration (Specialisation Program Business Administration)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Business Administration)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

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

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

Recommendation

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

Furthermore a combination with courses in the area of

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

is recommended.

Workload

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

M

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

Responsible: Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
9

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

Competence Certificate

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

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

Competence Goal

The students

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

Prerequisites

None

Content

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

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

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

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

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

Annotation

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

Workload

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

M

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

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
9

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

Competence Certificate

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

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

Competence Goal

Students shall be given the ability to

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

Prerequisites

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

Content

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

Recommendation

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

Workload

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

M

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

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

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

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

Competence Certificate

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

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

Competence Goal

See German version.

Prerequisites

None

Content

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

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

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

Recommendation

None

Annotation

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

M

6.14 Module: eFinance [M-WIWI-101402]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: [Business Administration \(Specialisation Program Business Administration\)](#)
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration\)](#)

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

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

Competence Certificate

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

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

Competence Goal

The students

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

Prerequisites

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

Content

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

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

Annotation

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

Part of: Compulsory Elective Modules (Informatics)

| Credits | Recurrence | Duration | Level | Version |
|---------|------------|------------|-------|---------|
| 9 | Each term | 1 semester | 3 | 12 |

| Election block: Compulsory Elective Area (between 1 and 2 items) | | | |
|--|---|--------|--|
| T-WIWI-110340 | Applied Informatics – Applications of Artificial Intelligence | 4,5 CR | Sure-Vetter |
| T-WIWI-110341 | Applied Informatics – Database Systems | 4,5 CR | Oberweis |
| T-WIWI-110342 | Applied Informatics – Information Security | 4,5 CR | Volkamer |
| T-WIWI-110339 | Applied Informatics – Principles of Internet Computing: Foundations for Emerging Technologies and Future Services | 4,5 CR | Sunyaev |
| T-WIWI-110338 | Applied Informatics – Modelling | 4,5 CR | Oberweis, Sure-Vetter |
| T-WIWI-110343 | Applied Informatics – Software Engineering | 4,5 CR | Oberweis |
| T-WIWI-110711 | Supplement Applied Informatics | 4,5 CR | Professoren-schaft des Fachbereichs Informatik |
| T-WIWI-104679 | Foundations of Mobile Business | 4,5 CR | Oberweis |
| Election block: Advanced Labs (at most 1 item) | | | |
| T-WIWI-111127 | Advanced Lab Blockchain Hackathon (Bachelor) | 4,5 CR | Sunyaev |
| T-WIWI-111124 | Advanced Lab Sociotechnical Information Systems Development (Bachelor) | 4,5 CR | Sunyaev |
| T-WIWI-110541 | Advanced Lab Informatics (Master) | 4,5 CR | Professoren-schaft des Fachbereichs Informatik |
| T-WIWI-108439 | Advanced Lab Security, Usability and Society | 4,5 CR | Volkamer |

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

Workload

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

M

6.16 Module: Electrical Engineering [M-ETIT-101155]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [Engineering Sciences \(mandatory\)](#)

| Credits | Recurrence | Duration | Level | Version |
|---------|------------------|------------|-------|---------|
| 3 | Each winter term | 1 semester | 3 | 1 |

| Mandatory | | | |
|---------------|---|------|-----------|
| T-ETIT-100533 | Electrical Engineering for Business Engineers, Part I | 3 CR | Menesklou |

Competence Certificate

The assessment of the module is carried out by a written examination about the lecture *Electrical Engineering I* [23223] (according to Section 4(2), 1 of the examination regulation).

The grade of the module corresponds to the grade of this examination.

Competence Goal

The student knows and understands basic terms of electrical engineering and should be able to carry out simple calculations of DC and AC circuits.

Content

Supporting the lecture, assignments to the curriculum are distributed. These are solved into additional (voluntary) tutorials.

Workload

See German version.

M

6.17 Module: Emphasis in Fundamentals of Engineering [M-MACH-101261]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Specialization in Fundamentals of Engineering (at least 9 credits) | | | |
|--|--|------|-----------|
| T-ETIT-100534 | Electrical Engineering for Business Engineers, Part II | 5 CR | Menesklou |
| T-MACH-102079 | Material Science II for Business Engineers | 5 CR | Hoffmann |
| T-MACH-102210 | Introduction to Engineering Mechanics II : Dynamics | 5 CR | Fidlin |

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 examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

Competence Goal

Students acquire and deepen skills in engineering fundamentals and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Content

The module content depends on the elected courses.

Annotation

Starting winter term 2016/1017 the course "Introduction to Engineering Mechanics II : Dynamics" [2162276] will be held in winter term.

Workload

See German version.

M

6.18 Module: Emphasis Materials Science [M-MACH-101262]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Specialization Materials Science (at least 9 credits) | | | |
|---|---|------|--------------------------|
| T-MACH-102141 | Constitution and Properties of Wearresistant Materials | 4 CR | Ulrich |
| T-MACH-105179 | Functional Ceramics | 4 CR | Hinterstein, Rheinheimer |
| T-MACH-100287 | Introduction to Ceramics | 6 CR | Hoffmann |
| T-MACH-102102 | Physical Basics of Laser Technology | 5 CR | Schneider |
| T-MACH-102137 | Polymer Engineering I | 4 CR | Elsner, Liebig |
| T-MACH-102138 | Polymer Engineering II | 4 CR | Elsner, Liebig |
| T-MACH-102157 | High Performance Powder Metallurgy Materials | 4 CR | Schell |
| T-MACH-102179 | Structural Ceramics | 4 CR | Hoffmann |
| T-MACH-102170 | Structural and Phase Analysis | 4 CR | Hinterstein, Wagner |
| T-MACH-100531 | Systematic Materials Selection | 4 CR | Dietrich, Schulze |
| 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-102079 | Material Science II for Business Engineers | 5 CR | Hoffmann |

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 examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

Competence Goal

Students acquire and deepen skills in fundamentals of materials science and engineering and can apply them to technical problems. Specific teaching objectives are agreed with the respective coordinator of the course.

Module grade calculation

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

Prerequisites

None

Content

The module content depends on the elected courses.

Workload

The module requires an average workload of 270 hours.

Learning type

Lecture, Tutorial.

M

6.19 Module: Energy Economics [M-WIWI-101464]

Responsible: Prof. Dr. Wolf Fichtner

Organisation: KIT Department of Economics and Management

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

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

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

Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction into Energy Economics* [2581010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

Competence Goal

The student

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

Prerequisites

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

Content

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

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

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

Recommendation

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

Annotation

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

Workload

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

M

6.20 Module: Energy Generation and Network Components [M-ETIT-101165]

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

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)

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

| Mandatory | | | |
|---------------|--|------|--------------------|
| T-ETIT-101924 | Power Generation | 3 CR | Hoferer |
| T-ETIT-101925 | Design and Operation of Power Transformers | 3 CR | Leibfried, Schäfer |

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 examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

Competence Goal

The student

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

Prerequisites

It is only possible to choose this module in combination with the module *Power Networks* [WW3INGETIT3]. The module is passed only after the final partial exam of *Power Networks* is additionally passed.

Content

The module deals with basic knowledge about the structure and operation of electrical power networks and their needed facilities. Further lectures give an insight into specific topics, such as Automation in electric power engineering or the procedures for generating electrical energy.

Workload

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

M

6.21 Module: Engineering Mechanics [M-MACH-101259]

Responsible: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: [Engineering Sciences \(mandatory\)](#)

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

| Mandatory | | | |
|---------------|--|------|--------|
| T-MACH-102208 | Introduction to Engineering Mechanics I: Statics and Strength of Materials | 3 CR | Fidlin |

Competence Certificate

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

Permitted utilities: non-programmable calculator, literature

Competence Goal

The student

- knows and understands the basic elements of statics,
- is able to solve basic problems in statics independently.

Prerequisites

None

Content

Statics: force • moment • general equilibrium conditions • center of gravity • inner forces in structure • plane frameworks • adhesion

Annotation

Starting summer 2016 the course "Introduction to Engineering Mechanics I : Statics and Strength of Materials" [2162238] will be held in summer term.

Workload

The total workload for this module is approximately 90 hours

Learning type

Lecture and exercises

M

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

| | |
|----------------------|--|
| Responsible: | Prof. Dr. Martin Ruckes Prof. Dr. Marliese Uhrig-Homburg |
| Organisation: | KIT Department of Economics and Management |
| Part of: | Business Administration (Specialisation Program Business Administration) Compulsory Elective Modules (Business Administration oder Engineering Sciences) Compulsory Elective Modules (Business Administration) |

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

Workload

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

M

6.23 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 (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

| Credits | Recurrence | Level | Version |
|---------|------------|-------|---------|
| 9 | Once | 3 | 5 |

| Election block: Compulsory Elective Courses (between 9 and 12 credits) | | | |
|--|--------------------|------|--|
| T-WIWI-106291 | 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 coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points (max. 12 credits) and at least 6 hours per week (max. 8 hours per week). The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

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

Competence Goal

See German version.

Prerequisites

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

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

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

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

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

Part of: Informatics (mandatory)

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

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

Competence Certificate

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

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

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

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

Competence Goal

The student

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

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

Prerequisites

None

Content

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

Recommendation

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

Workload

The total workload for this module is approximately 300 hours.

M

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

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

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

| Mandatory | | | |
|--|--|--------|----------|
| T-WIWI-102805 | Managing the Marketing Mix | 4,5 CR | Klarmann |
| Election block: Supplementary Courses (at least 4,5 credits) | | | |
| T-WIWI-102806 | Services Marketing and B2B Marketing | 3 CR | Feurer |
| T-WIWI-102807 | International Marketing | 1,5 CR | Feurer |

Competence Certificate

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

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

Competence Goal

The aim of this module is to prepare students for a job in marketing or sales. Especially in technically oriented companies, employees who have a certain technical background as industrial engineers or business informatics specialists are often fit for this purpose. Students

- know the most important concepts, procedures and theories of the four instruments of the marketing mix (product management, price management, communication management and sales management)
- have the knowledge to make decisions regarding current and future products (product innovations) (e.g. by means of conjoint analysis)
- know how customers perceive brands and how this perception can be influenced by the company
understand how customers react to prices (for example, using price-sales functions)
can determine prices on the basis of conceptual and quantitative considerations
know the basics of price differentiation
- are familiar with various instruments of communication (e.g. TV advertising) and can design them accurately
- make communication decisions systematically (e.g. using media planning)
can segment the market and position the product
- know how to assess the importance and satisfaction of customers
can shape the relationship with customers and sales partners
- know about special features of marketing in the service and B2B sector
- know the specifics of marketing in an international context

Prerequisites

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

Content

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

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

Annotation

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

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

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

| Mandatory | | | |
|---------------|--|------|--------------------------------|
| T-WIWI-102817 | Business Administration: Strategic Management and Information Engineering and Management | 3 CR | Nieken, Ruckes |
| T-WIWI-102819 | Business Administration: Finance and Accounting | 4 CR | Ruckes, Uhrig-Homburg, Wouters |

Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the individual courses of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedure of each course of this module is defined for each course separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal

The student

- has core skills in business administration in particular with respect to decision making and the model based view of business corporations
- masters the fundamentals of business and information management as well as the fundamentals business finance and the principles of business accounting
- is able to analyze and assess central tasks, functions and decisions in modern corporations

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

Prerequisites

None

Content

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

Recommendation

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

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

Credits
8

Recurrence
Each term

Language
German

Level
3

Version
1

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

Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures of each course of this module is defined for each course separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal

The student

- has core skills in business administration in particular with respect to decision making and the model based view of business corporations
- masters the fundamentals of production and operations management and marketing as well as the fundamentals of management and financial accounting
- is able to analyze and assess central tasks, functions and decisions in modern corporations

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

Prerequisites

None

Content

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

Recommendation

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

Workload

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

M

6.28 Module: Fundamentals of Construction [M-BGU-101004]

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

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

| Mandatory | | | |
|--------------|---|------|-----------|
| T-BGU-101691 | Construction Technology | 6 CR | Haghsheno |
| T-BGU-101675 | Project Management | 3 CR | Haghsheno |

Competence Goal

The student

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

Prerequisites

none

Recommendation

None

Annotation

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

M

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

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
6

| Election block: Compulsory Elective Courses (9 credits) | | | | |
|---|-------------------------------------|--------|--------------------|--|
| T-WIWI-109938 | Digital Services | 4,5 CR | Satzger, Weinhardt | |
| T-WIWI-109816 | Foundations of Interactive Systems | 4,5 CR | Mädche | |
| T-WIWI-110888 | Practical Seminar: Digital Services | 4,5 CR | Satzger, Weinhardt | |

Competence Certificate

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

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

Competence Goal

Students

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

Prerequisites

None

Content

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

Recommendation

None

Annotation

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

Workload

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

M

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

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Vehicle Properties (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 separately.

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

Competence Goal

The student

- knows and 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

6.31 Module: Human Resources and Organizations [M-WIWI-101513]**Responsible:** Prof. Dr. Petra Nieken**Organisation:** KIT Department of Economics and Management**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration\)](#)**Credits**
9**Recurrence**
Each term**Language**
German**Level**
3**Version**
4

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

Competence Certificate

The assessment is carried out as partial written exams of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

Competence Goal

The student

- knows and analyzes basic concepts, instruments, and challenges of present human resource and organizational management.
- uses the techniques he / she has learned to evaluate strategic situations which occur in human resource and organizational management.
- evaluates the strengths and weaknesses of existing structures and rules based on systematic criterions.
- Discusses and evaluates the practical use of models and methods by using case studies.
- has basic knowledge of fit and challenges of different scientific methods in the context of personnel and organizational economics.

Prerequisites

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

Content

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

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

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

Recommendation

Completion of module Business Administration is recommended.

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

Workload

The total workload for this module is approximately 270 hours.

M

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

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

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

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

Competence Certificate

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

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

Competence Goal

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

Prerequisites

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

Content

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

Workload

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

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

M

6.33 Module: Information Systems & Digital Business: Interaction [M-WIWI-104911]

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

Organisation: KIT Department of Economics and Management

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
3

| Election block: Compulsory Elective Area () | | | |
|---|--|--------|-------------------|
| T-WIWI-109816 | Foundations of Interactive Systems | 4,5 CR | Mädche |
| T-WIWI-109936 | Platform Economy | 4,5 CR | Dorner, Weinhardt |
| T-WIWI-109935 | Practical Seminar Interaction | 4,5 CR | Mädche, Weinhardt |
| T-WIWI-106569 | Consumer Behavior | 4,5 CR | Scheibehenne |

Competence Certificate

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

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

Competence Goal

Students

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

Content

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

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

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

Workload

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

M

6.34 Module: Information Systems & Digital Business: Platforms [M-WIWI-104912]

| | |
|----------------------|--|
| Responsible: | Prof. Dr. Gerhard Satzger Prof. Dr. Christof Weinhardt |
| Organisation: | KIT Department of Economics and Management |
| Part of: | Business Administration (Specialisation Program Business Administration) Compulsory Elective Modules (Business Administration oder Engineering Sciences) Compulsory Elective Modules (Business Administration) |

| | | | | |
|----------------|-------------------|-----------------|--------------|----------------|
| Credits | Recurrence | Language | Level | Version |
| 9 | Each term | German | 3 | 4 |

| Election block: Compulsory Elective Courses () | | | |
|---|--|--------|--------------------|
| T-WIWI-109938 | Digital Services | 4,5 CR | Satzger, Weinhardt |
| T-WIWI-110797 | eFinance: Information Systems for Securities Trading | 4,5 CR | Weinhardt |
| T-WIWI-109936 | Platform Economy | 4,5 CR | Dorner, Weinhardt |
| T-WIWI-109937 | Practical Seminar Platforms | 4,5 CR | Satzger, Weinhardt |

Competence Certificate

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

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

Competence Goal

Students

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

Content

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

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

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

Workload

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

M

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

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Gerhard Satzger

Organisation: KIT Department of Economics and Management

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
2

| Election block: Compulsory Elective Courses () | | | |
|--|--|--------|--------------------|
| T-WIWI-109938 | Digital Services | 4,5 CR | Satzger, Weinhardt |
| T-WIWI-109816 | Foundations of Interactive Systems | 4,5 CR | Mädche |
| T-WIWI-109939 | Practical Seminar Servitization | 4,5 CR | Mädche, Satzger |

Competence Certificate

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

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

Competence Goal

Students

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

Content

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

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

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

Workload

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

M

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

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Mandatory | | | |
|---------------|---|------|-------|
| T-MACH-109054 | Integrated Production Planning in the Age of Industry 4.0 | 9 CR | Lanza |

Competence Certificate

Written Exam (120 min)

Competence Goal

The students

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

Prerequisites

none

Content

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

Workload

regular attendance: 63 hours

self-study: 207 hours

Learning type

Lecture, exercise, excursion

M

6.37 Module: Internship [M-WIWI-101419]

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

| Credits | Recurrence | Level | Version |
|---------|------------|-------|---------|
| 10 | Once | 3 | 2 |

| Mandatory | | | |
|---------------|------------|-------|---|
| T-WIWI-102611 | Internship | 10 CR | Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften |

Competence Certificate

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

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

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

The certificate must at least contain the following information:

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

2. Information on to the presentation:

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

Competence Goal

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

Prerequisites

None

Content

The internship may be done in economic, business and/or technical companies. At best, it is done on activities which are located at the intersection of the two fields - getting to know the specific requirements of Industrial Engineering and Management.

A commercial internship provides an insight into business or administrative processes of business transactions. Therefore departments such as controlling, organizing, marketing and planning appear particularly suitable.

Work experiences in the departments of engineering, work preparation and provision of material or IT cover more technical aspects of the internship. But work experiences in an engineering firm go with a technical internship.

It remains the companies and interns left, which stations and areas the intern will eventually go through. But the focus should always be in accordance with operational realities of the company.

Annotation

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

Regarding to the election of the company, in which the internship is completed, there are no specific rules. With a view to the future professional career, it is recommended to absolve the internship in a larger, possibly international company.

Vacation days are not figured into the internship.

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

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

Workload

The total workload for this module is approximately 300 hours.

M

6.38 Module: Introduction to Economics [M-WIWI-101398]

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

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

| Mandatory | | | |
|---------------|--|------|-------------|
| T-WIWI-102708 | Economics I: Microeconomics | 5 CR | Puppe, Reiß |
| T-WIWI-102709 | Economics II: Macroeconomics | 5 CR | Wigger |

Competence Certificate

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module. The assessment procedures of each course of this module is defined for each course separately.

Competence Goal

The student

- knows and understands basic economic problems,
- understands economic policy in globalized markets,
- is able to develop elementary solution concepts.

The lectures of this module have different focuses: In Economics I, economic problems are seen as decision problems, Economics II treats the dynamics of economic processes.

Module grade calculation

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.

Content

The basic concepts, methods and models of micro- and macroeconomics are treated. The course *Economics I: Microeconomics [2600012]* deals with micro-economic decision theory, questions of market theory and problems of imperfect competition and with basic principles of game theory and welfare economics. *Economics II: Macroeconomics [2600014]* discusses economic organization models and national accounts as well as the question of international trade and monetary policy. Furthermore, the complex growth, boom and economic speculations are dealt with.

Annotation

Notice: The lecture *Economics I: Microeconomics [2600012]* is part of the preliminary examination concerning § 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

Workload

See German version.

M

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

Responsible: apl. Prof. Dr. Michael Kunz

Organisation: KIT Department of Economics and Management

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
3

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

Competence Certificate

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

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

Competence Goal

See German version

Prerequisites

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

Content

See German version

Recommendation

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

Annotation

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

Part of: [Operations Research \(mandatory\)](#)

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

| Mandatory | | | |
|---------------|--|------|--------------------------|
| T-WIWI-102758 | Introduction to Operations Research I and II | 9 CR | Nickel, Rebennack, Stein |

Competence Certificate

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

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

Competence Goal

The student

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

Module grade calculation

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

Prerequisites

None

Content

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

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

Workload

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

M

6.41 Module: Introduction to Programming [M-WIWI-101581]

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

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

| Mandatory | | | |
|---------------|---|------|---------|
| T-WIWI-102735 | Introduction to Programming with Java | 5 CR | Zöllner |

Competence Certificate

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

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

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

Competence Goal

see german version

Prerequisites

None

Content

see german version

Workload

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

M

6.42 Module: Introduction to Statistics [M-WIWI-101432]

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

Organisation: KIT Department of Economics and Management

Part of: [Statistics](#)

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

| Mandatory | | | |
|---------------|-------------------------------|------|------------------|
| T-WIWI-102737 | Statistics I | 5 CR | Grothe, Schienle |
| T-WIWI-102738 | Statistics II | 5 CR | Grothe, Schienle |

Competence Certificate

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

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

Competence Goal

See German version.

Module grade calculation

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

Prerequisites

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

Content

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate und bivariate analysis

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

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

Workload

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

M

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

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

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

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

| Mandatory | | | |
|---------------|---|------|---------|
| T-MACH-110771 | Logistics and Supply Chain Management | 9 CR | Furmans |

Competence Certificate

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

Competence Goal

The student

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

Prerequisites

None

Content

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

Learning type

Lectures, tutorials, case studies.

Literature

Knut Alicke: Planung und Betrieb von Logistiknetzwerken: Unternehmensübergreifendes Supply Chain Management, 2003
 Dieter Arnold et. al.: Handbuch Logistik, 2008
 Marc Goetschalkx: Supply Chain Engineering, 2011

M

6.44 Module: Machine Learning and Data Science [M-WIWI-105482]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: [Business Administration \(Specialisation Program Business Administration\)](#)
[Compulsory Elective Modules \(Business Administration\)](#)

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

| Mandatory | | | |
|---------------|--|--------|----------------------|
| T-WIWI-111028 | Introduction to Machine Learning | 4,5 CR | Geyer-Schulz, Nazemi |
| T-WIWI-111029 | Introduction to Neural Networks and Genetic Algorithms | 4,5 CR | Geyer-Schulz |

Competence Certificate

The module examination is carried out in the form of partial examinations of the selected courses of the module, with which in total the minimum requirement of credit points is fulfilled. The kind of examination is described in detail for each course of this module.

Competence Goal

The student

- knows the main families of machine learning methods, their basic principles, assumptions and restrictions.
- can use these methods to solve data analysis problems, to support decision making or for process automation in companies and use the solutions interpreted and evaluated accordingly.
- can compare and evaluate the performance of solutions.

Prerequisites

None

Content

The module mainly focuses on methods from statistical learning (linear and logistic learning, regression, tree methods, SVMs, and shrinkage estimators) and from the field of neural and genetic procedures were presented. Furthermore, data transformations and -presentations (e.g. dimension reduction, clustering, imputation in case of missing data) and visualization techniques and appropriate inference, diagnosis and validation techniques are presented.

Workload

Total effort for 9 credit points: approx. 270 hours. The allocation is based on the credit points of the courses of the module.

M

6.45 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 \(Specialisation Program Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Engineering Sciences\)](#)

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

| Mandatory | | | |
|---------------|--|------|-----------|
| T-MACH-110963 | Machine Tools and High-Precision Manufacturing Systems | 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 high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

Prerequisites
 None

Content

The module gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the module a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems 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:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

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

Learning type
 Lecture, exercise, excursio

M

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

Responsible: Prof. Dr. Marcus Wouters

Organisation: KIT Department of Economics and Management

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

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

| Mandatory | | | | |
|---------------|---|--|--------|---------|
| T-WIWI-102800 | Management Accounting 1 | | 4,5 CR | Wouters |
| T-WIWI-102801 | Management Accounting 2 | | 4,5 CR | Wouters |

Competence Certificate

The assessment is carried out as partial exams (according to Section 4 (2), 13 SPO) of the courses of this module. The assessment procedures are described for each course of the module separately.

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

Competence Goal

Students

- are familiar with various management accounting methods,
- can apply these methods for cost estimation, profitability analysis, and product costing,
- are able to analyze short-term and long-decisions with these methods,
- have the capacity to devise instruments for organizational control.

Prerequisites

None

Content

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

Annotation

The following courses are part of this module:

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

Workload

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

M

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

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| 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

6.48 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 \(Specialisation Program Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Engineering Sciences\)](#)

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

| Mandatory | | | |
|---------------|---|------|---------|
| T-MACH-102151 | Material Flow in Logistic Systems | 9 CR | Furmans |

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

none

Content

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

Workload

270 hours

Learning type

Lectures, tutorials.

M

6.49 Module: Materials Science [M-MACH-101260]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: [Engineering Sciences \(mandatory\)](#)

| Credits | Recurrence | Duration | Level | Version |
|---------|------------------|------------|-------|---------|
| 3 | Each winter term | 1 semester | 3 | 1 |

| Mandatory | | | |
|---------------|-------------------------------------|------|----------|
| T-MACH-102078 | Materials Science I | 3 CR | Hoffmann |

Competence Certificate

The assessment of the module is carried out by a written examination (150 min) about the lecture *Material Science I* [2125760] (according to Section 4(2), 1 of the examination regulation).

The examination is offered every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

The grade of the module corresponds to the grade of this examination.

Competence Goal

Students are able to specify the basics of materials science and engineering and can apply it to simple problems in various technical areas.

As major part of the module, the students know the correlation between atomic structure and bonding of solids and the macroscopic properties such as mechanical behavior or electrical conductivity. They have basic knowledge with respect to materials characterization. The students are able to analyze phase diagrams with up to two components and can derive simple correlations among composition, processing, microstructure evolution and materials properties.

Prerequisites

None.

Content

After an introduction to the atomic structure and interatomic bonding, elementary concepts of crystallography are given. Different types of crystal structures are explained and various types of imperfections in solids. Then, the mechanical behaviour and the physical properties of various types of materials (metals, polymers, ceramics) are discussed. The thermodynamic principles of solidification and the basic types of phase diagrams are given to understand to iron-carbon phase diagram and the manifold microstructures of steel and cast iron.

Workload

The total workload for this module is approximately 90 hours.

M

6.50 Module: Mathematics 1 [M-MATH-101676]

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

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

| Mandatory | | | |
|---------------|------------------------------|--------|----------------------------|
| T-MATH-102260 | Mathematics I - Midterm Exam | 3,5 CR | Folkers, Hug, Last, Winter |
| T-MATH-102261 | Mathematics I - Final Exam | 3,5 CR | Folkers, Hug, Last, Winter |

Competence Certificate

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

Competence Goal

Students

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

Module grade calculation

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

Content

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

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

Recommendation

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

Workload

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

M

6.51 Module: Mathematics 2 [M-MATH-101677]

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

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

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

Competence Certificate

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

Competence Goal

Students

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

Module grade calculation

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

Content

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

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

Recommendation

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

Workload

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

M

6.52 Module: Mathematics 3 [M-MATH-101679]

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

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

| Mandatory | | | |
|---------------|--|------|----------------------------|
| T-MATH-102264 | Mathematics III - Final Exam | 7 CR | Folkers, Hug, Last, Winter |

Competence Certificate

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

Competence Goal

Students

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

Module grade calculation

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

Content

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

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

Workload

work load: 210 hours (7 ECTS)

classes: 60 hours lectures + 30 hours exercises

M

6.53 Module: Mechanical Design [M-MACH-101299]

Responsible: Prof. Dr.-Ing. Sven Matthiesen

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

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

| Mandatory | | | |
|---------------|---------------------------------------|------|------------|
| T-MACH-110363 | Mechanical Design Basics I and II | 7 CR | Matthiesen |
| T-MACH-110364 | Mechanical Design Basics I, Tutorial | 1 CR | Matthiesen |
| T-MACH-110365 | Mechanical Design Basics II, Tutorial | 1 CR | Matthiesen |

Competence Certificate

Written examination on the contents of Mechanical Design I&II

Duration: 90 min plus reading time

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

Competence Goal

Learning object springs:

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

Learning objects Technical Systems:

- Being able to explain what a technical system is
- "Thinking in systems."
- Using system technology as an abstraction tool for handling complexity
- Recognizing functional relationships of technical systems
- Getting to know the concept of function
- be able to use C&C²-A as a means of system technology

Learning objects Visualization:

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

Learning objects Bearings:

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

Learning objectives seals:

The students...

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

Learning design:

The students...

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

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

Learning bolted connections:

The students...

- can list and explain various bolt applications.
- can recognize bolt types and explain their function
- can build a C&C² model of a bolted joint and discuss the influences on its function
- can explain the function of a bolted connection with the help of a spring model
- can reproduce, apply and discuss the screw equation.
- Can estimate the load-bearing capacity of low-loaded bolted joints for dimensioning purposes
- Can indicate which bolted joint is to be calculated and which only roughly dimensioned.
- Can carry out the dimensioning of bolted connections as flange connections
- Can create, explain and discuss the force deflection diagram of a bolted connection

Prerequisites

None

Content

MKL I:

Introduction to product development

Tools for visualization (technical drawing)

Product creation as a problem solution

Technical Systems Product Development

- Systems theorie
- Contact and Channel Approach C&C²-A

Basics of selected construction and machine elements

- Federn
- bearings and fence
- sealings

The lecture is accompanied by exercises with the following content:

gear workshop

Tools for visualization (technical drawing)

Technical Systems Product Development

- Systemtheorie
- Contact amd Channel Approach C&C²-A

Exercises for springs

Exercises for bearings and fence

MKL II:

- sealings
- design
- dimensioning
- component connections
- bolts

Recommendation

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

Workload**MKL1:****presence: 33,5 h**Attendance in lectures: $15 * 1.5 \text{ h} = 22.5 \text{ h}$ Presence in exercises: $8 * 1.5 \text{ h} = 12 \text{ h}$ **self-study: 56,5 h**

Personal preparation and wrap-up of lecture and exercises including the processing of the test certificates and preparation for the exam: 56.5 h

Total: 90 h = 3 LP**MKL2:****Presence: 33 h**Attendance in lectures: $15 * 1.5 \text{ h} = 22.5 \text{ h}$ Presence in exercises: $7 * 1.5 \text{ h} = 10.5 \text{ h}$ **Self study: 87 h**

Personal preparation and wrap-up of lectures and exercises, including the processing of the test certificates and preparation for the exam: 87h

Total: 150 h = 5 LP**Additional expenditure for degree programs from other disciplines MKL1 + MKL2 in total: 30 h = 1 LP****Learning type**

Lecture

Tutorial

Project work during the semester

Online-test

M

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

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

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

Content

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

Recommendation

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

Annotation

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

Workload

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

M

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

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

Credits
9

Recurrence
Each term

Language
German

Level
4

Version
3

| Election block: Mikrosystemtechnik (at least 9 credits) | | | |
|---|--|------|---|
| T-MACH-102165 | Selected Topics on Optics and Microoptics for Mechanical Engineers | 3 CR | Heckele, 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

none

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

6.56 Module: Mobile Machines [M-MACH-101267]

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

| Credits | Recurrence | Language | Level | Version |
|---------|------------|----------|-------|---------|
| 9 | Each term | German | 4 | 3 |

| Mandatory | | | |
|---------------|-----------------------------------|------|--------|
| T-MACH-110959 | Basics of Mobile Working Machines | 9 CR | Geimer |

Competence Certificate

The assessment is carried out as a general oral exam of the single courses of this module.

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

Competence Goal

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 student is able to

- apply and evaluate the physical principles of hydrostatics,
- name common components and explain how they work,
- calculate hydrostatic systems,
- describe mobile working machines,
- characterize fields of application of the machines,
- describe the construction of the machine.

After a successful participation:

- the student can name the wide range of mobile working machines
- the student knows the possible applications and processes of the most important mobile working machines
- the student can describe selected subsystems and components

Content

In the module of *Mobile Machines* [WI4INGMB15] the students will learn the structure of the machines and basics of hydraulics. The module is practically orientated and supported by industry partners.

Workload

270 hours

Learning type

- Research-oriented teaching
- lectures
- exercises

M

6.57 Module: Mobility and Infrastructure [M-BGU-101067]

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

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

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

Prerequisites
 none

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

Annotation
 none

M

6.58 Module: Module Bachelor Thesis [M-WIWI-101601]

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

| Credits | Recurrence | Language | Level | Version |
|---------|------------|----------|-------|---------|
| 12 | Each term | German | 3 | 5 |

| Mandatory | | | |
|---------------|-----------------|-------|---|
| T-WIWI-103067 | Bachelor Thesis | 12 CR | Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften |

Competence Certificate

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

- according to SPO 2007 by at least one examiner of the Department of Economics and Management, or, after approval by at least one examiner of another faculty. The examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.
- according to SPO 2015 by at least two examiners of the Department of Economics and Management.

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

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

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

Competence Goal

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

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

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

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

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

Prerequisites

Prerequisites for admission to the Bachelor Thesis:

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

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

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

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

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

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

Content

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

Workload

The total workload for this module is approximately 360 hours. For further information see German version.

M

6.59 Module: Optimization under Uncertainty [M-WIWI-103278]

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

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

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

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

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

Content

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

Recommendation

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

Annotation

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

Workload

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

M

6.60 Module: Power Network [M-ETIT-102379]

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

Organisation: KIT Department of Electrical Engineering and Information Technology

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

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

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

M

6.61 Module: Preliminary Exam [M-WIWI-100950]

Organisation: University

Part of: Preliminary Exam

Credits
0

Recurrence
Each term

Language
German

Level
3

Version
1

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

Modelled deadline

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

Prerequisites

none

Annotation

Due to the effects of the corona pandemic 2020 on the course of study, KIT has decided to extend the deadline for taking the orientation examination by one semester each for first-year students of WS 18/19 and first-year students of WS 19/20.

M

6.62 Module: Product Lifecycle Management [M-MACH-101270]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Product Lifecycle Management (Kernbereich) (1 item) | | | |
|---|---|------|-------------------|
| T-MACH-105147 | Product Lifecycle Management | 4 CR | Ovtcharova |
| Election block: Product Lifecycle Management (2 items) | | | |
| T-MACH-102153 | PLM-CAD Workshop | 4 CR | Ovtcharova |
| T-MACH-102181 | PLM for Product Development in Mechatronics | 4 CR | Eigner |
| T-MACH-102209 | Information Engineering | 3 CR | Ovtcharova |
| T-MACH-106744 | Agile Product Innovation Management - Value-driven Planning of New Products | 4 CR | Kläger |
| T-MACH-106457 | I4.0 Systems Platform | 4 CR | Maier, Ovtcharova |
| T-MACH-102083 | Integrated Information Systems for Engineers | 4 CR | Ovtcharova |
| T-MACH-102155 | Product, Process and Resource Integration in the Automotive Industry | 4 CR | Mbang |
| T-MACH-102149 | Virtual Reality Practical Course | 4 CR | Ovtcharova |
| T-MACH-102187 | CAD-NX Training Course | 2 CR | Ovtcharova |

Competence Certificate

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

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

Competence Goal

The students should:

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

Prerequisites

None

Content

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

Workload

270 hours

M

6.63 Module: Public and Civil Law [M-INFO-105084]

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

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

| Mandatory | | | |
|---------------|---|------|-------------|
| T-INFO-103339 | Civil Law for Beginners | 5 CR | Matz |
| T-INFO-110300 | Public Law I & II | 6 CR | Eichenhofer |

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

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

Prerequisites

None

Workload

See German version.

M

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

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

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

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

Competence Certificate

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

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

Competence Goal

See German version.

Content

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

Recommendation

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

Annotation

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

Workload

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

M

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

Responsible: Prof. Dr.-Ing. Marcus Geimer
Prof. Dr.-Ing. Peter Gratzfeld

Organisation: KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Engineering Sciences)

| Credits | Recurrence | Language | Level | Version |
|---------|------------|----------|-------|---------|
| 9 | Each term | German | 4 | 4 |

| Mandatory | | | |
|---------------|------------------------|------|-------------------|
| T-MACH-102143 | Rail System Technology | 9 CR | Geimer, Gratzfeld |

Competence Certificate

Oral examination

Duration: ca. 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 judge 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.

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. Vehicle system technology: structure and main systems of rail vehicles
9. Car body: functions, requirements, design principles, crash elements, interfaces
10. Bogies: forces, running gears, bogies, axle configuration
11. Drives: principles, electric powertrains, non-electric powertrains
12. Brakes: basics, principles, brake control
13. Train control management system: definitions, bus systems, components, network architecture, examples, trends
14. 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

6.66 Module: Real Estate Management [M-WIWI-101466]

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

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

None

Content

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

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

Recommendation

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

Furthermore a combination with courses in the area of

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

is recommended.

Workload

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

M

6.67 Module: Seminar Module [M-WIWI-101816]

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

Credits
3

Recurrence
Each term

Language
German

Level
3

Version
5

| Election block: Compulsory Elective Courses (3 credits) | | | |
|---|--|------|---|
| T-WIWI-103486 | Seminar in Business Administration (Bachelor) | 3 CR | Professorenschaft des Fachbereichs Betriebswirtschaftslehre |
| T-WIWI-103485 | Seminar in Informatics (Bachelor) | 3 CR | Professorenschaft des Fachbereichs Informatik |
| T-WIWI-108763 | Seminar in Engineering Science Master (approval) | 3 CR | Fachvertreter ingenieurwissenschaftlicher Fakultäten |
| T-MATH-102265 | Seminar in Mathematics (Bachelor) | 3 CR | Folkers, Last |
| T-WIWI-103488 | Seminar in Operations Research (Bachelor) | 3 CR | Nickel, Rebennack, Stein |
| T-INFO-101997 | Seminar: Legal Studies I | 3 CR | Dreier |
| T-WIWI-103489 | Seminar in Statistics (Bachelor) | 3 CR | Grothe, Schienle |
| T-WIWI-103487 | Seminar in Economics (Bachelor) | 3 CR | Professorenschaft des Fachbereichs Volkswirtschaftslehre |
| T-MACH-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 |

Competence Certificate

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

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

Competence Goal

- Students are able to independently deal with a defined problem in a specialized field based on scientific criteria.
- They are able to research, analyze the information, abstract and derive basic principles and regularities from unstructured information.
- They can solve the problems in a structured manner using their interdisciplinary know-how.
- They know how to validate the obtained results.
- Finally, they are able to logically and systematically present the results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Prerequisites

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

Content

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

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

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

Annotation

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

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

Workload

See German version.

M

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

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

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

| Mandatory | | | |
|-------------------|---|------|----------|
| T-GEISTSOZ-109047 | Analalysis of Social Structurs (WiWi) | 3 CR | Nollmann |
| T-GEISTSOZ-109048 | Social Science A (WiWi) | 3 CR | Nollmann |
| T-GEISTSOZ-109049 | Social Science B (WiWi) | 3 CR | Nollmann |

Competence Goal

The student

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

Content

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

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

M

6.69 Module: Specialization in Customer Relationship Management [M-WIWI-101422]**Responsible:** Prof. Dr. Andreas Geyer-Schulz**Organisation:** KIT Department of Economics and Management**Part of:** [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)**Credits**
9**Recurrence**
Each term**Language**
German**Level**
3**Version**
5

| Mandatory | | | |
|--|---|--------|--------------------|
| T-WIWI-102597 | Operative CRM | 4,5 CR | Geyer-Schulz |
| Election block: Supplementary Courses (1 item) | | | |
| T-WIWI-102596 | Analytical CRM | 4,5 CR | Geyer-Schulz |
| T-WIWI-109938 | Digital Services | 4,5 CR | Satzger, Weinhardt |
| T-WIWI-100005 | Competition in Networks | 4,5 CR | Mitusch |

Competence Certificate

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

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

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

Competence Goal

The student

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

Prerequisites

The course "Operative CRM" is compulsory.

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

Content

In this module, analysis methods and techniques for the management and improvement of customer relations are presented. Furthermore, modelling, implementation, introduction, change, analysis and valuation of operative CRM processes are treated. Regarding the first part, we teach analysis methods and techniques suitable for the management and improvement of customer relations. For this goal we treat the principles of customer- and service-oriented management as the foundation of successful customer relationship management. In addition, we show how knowledge of the customer can be used for decision-making at an aggregate level (e.g. planning of assortments, analysis of customer loyalty, ...). A basic requirement for this is the integration and collection of data from operative processes in a suitably defined data-warehouse in which all relevant data is kept for future analysis. The process of transferring data from the operative systems into the data warehouse is known as the ETL process (Extract / Transform / Load). The process of modelling a data-warehouse as well as the so-called extraction, transformation, and loading process for building and maintaining a data-warehouse are discussed in-depth. The data-warehouse serves as a base for flexible management reporting. In addition, various statistic methods (e.g. cluster analysis, regression analysis, stochastic models, ...) are presented which help in computing suitable key performance indicators or which support decision-making.

Regarding the operative part, we emphasize the design of operative CRM processes. This includes the modelling, implementation, introduction and change, as well as the analysis and evaluation of operative CRM processes. Petri nets and their extensions are the scientific foundation of process modelling. The link of Petri nets to process models used in industry as e.g. UML activity diagrams is presented. In addition, a framework for process innovation which aims at a radical improvement of key business processes is introduced. The following application areas of operative CRM processes are presented and discussed:

Strategic marketing processes

Operative marketing processes (campaign management, permission marketing, ...)

Customer service processes (sales force management, field services, call center management, ...)

Workload

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

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

M

6.70 Module: Specialization in Production Engineering [M-MACH-101284]**Responsible:** Prof. Dr.-Ing. Volker Schulze**Organisation:** KIT Department of Mechanical Engineering

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

| | | | | |
|---------------------|--------------------------------|---------------------------|-------------------|---------------------|
| Credits 9 | Recurrence Each term | Language German | Level 3 | Version 4 |
|---------------------|--------------------------------|---------------------------|-------------------|---------------------|

| Election block: Vertiefung der Produktionstechnik (at least 9 credits) | | | |
|--|--|------|----------------------|
| T-MACH-110176 | Digitalization from Production to the Customer in the Optical Industry | 4 CR | Wawerla |
| T-MACH-110991 | Global Production | 4 CR | Lanza |
| T-MACH-110981 | Tutorial Global Production | 1 CR | Lanza |
| T-MACH-105188 | Integrative Strategies in Production and Development of High Performance Cars | 4 CR | Schlichtenmayer |
| T-MACH-105783 | Learning Factory "Global Production" | 6 CR | Lanza |
| T-MACH-108878 | Laboratory Production Metrology | 5 CR | Häfner |
| T-MACH-110318 | Product- and Production-Concepts for Modern Automobiles | 4 CR | Kienzle, Steegmüller |
| T-MACH-110984 | Production Technology for E-Mobility | 4 CR | Fleischer, Hofmann |
| T-MACH-110960 | Project Internship Additive Manufacturing: Development and Production of an Additive Component | 4 CR | Zanger |
| 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

none

Content

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

Workload

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

Learning type

Lectures, seminars, workshops, excursions

M

6.71 Module: Statistics and Econometrics [M-WIWI-101599]

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

Organisation: KIT Department of Economics and Management

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

Credits
9

Recurrence
Each term

Language
German

Level
3

Version
4

| Election block: Supplementary Courses (between 1 and 2 items) | | | |
|---|---|--------|--------------|
| T-WIWI-103063 | Analysis of Multivariate Data | 4,5 CR | Grothe |
| T-WIWI-103066 | Data Mining and Applications | 4,5 CR | Nakhaeizadeh |
| T-WIWI-103064 | Financial Econometrics | 4,5 CR | Schienle |
| T-WIWI-110939 | Financial Econometrics II | 4,5 CR | Schienle |
| T-WIWI-103065 | Statistical Modeling of Generalized Regression Models | 4,5 CR | Heller |
| Mandatory | | | |
| T-WIWI-102736 | Economics III: Introduction in Econometrics | 5 CR | Schienle |

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

The course "Economics III: Introduction in Econometrics" is compulsory and must be examined. In case the course „Economics III: Introduction in Econometrics“ has already been examined within the module „Applied Microeconomics“, the course „Economics III: Introduction in Econometrics“ is not compulsory.

Content

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

Workload

The total workload for this module is approximately 270 hours.

M

6.72 Module: Statistics and Econometrics II [M-WIWI-105414]

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

| | | | | |
|---------------------|--------------------------------|---------------------------|-------------------|---------------------|
| Credits 9 | Recurrence Each term | Language German | Level 3 | Version 1 |
|---------------------|--------------------------------|---------------------------|-------------------|---------------------|

| Election block: Compulsory Elective Courses () | | | |
|--|---|--------|--------------|
| T-WIWI-103063 | Analysis of Multivariate Data | 4,5 CR | Grothe |
| T-WIWI-103066 | Data Mining and Applications | 4,5 CR | Nakhaeizadeh |
| T-WIWI-103064 | Financial Econometrics | 4,5 CR | Schienle |
| T-WIWI-110939 | Financial Econometrics II | 4,5 CR | Schienle |
| T-WIWI-103065 | Statistical Modeling of Generalized Regression Models | 4,5 CR | Heller |

Competence Certificate

The assessment is carried out as partial exams of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

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

Competence Goal

The student

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

Prerequisites

The following module must be passed: Statistics and Econometrics [M-WIWI-101599]

Content

The courses provide foundations of advanced Econometric and statistical techniques for regression, time series and multivariate analysis.

Workload

The total workload for this module is approximately 270 hours.

M

6.73 Module: Strategy and Organization [M-WIWI-101425]**Responsible:** Prof. Dr. Hagen Lindstädt**Organisation:** KIT Department of Economics and Management**Part of:** [Business Administration \(Specialisation Program Business Administration\)](#)
[Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration\)](#)**Credits**
9**Recurrence**
Each term**Language**
German**Level**
3**Version**
4

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

Competence Certificate

Erfolgreicher Abschluss aller fachlich entsprechenden Module aus dem Grundlagenprogramm.

Competence Goal

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

Content

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

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

Workload

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

M

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

Responsible: Prof. Dr. Stefan Nickel

Organisation: KIT Department of Economics and Management

Part of: [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)
[Compulsory Elective Modules \(Business Administration\)](#)

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

| Mandatory | | | |
|--|---|--------|-------------------|
| T-WIWI-109936 | Platform Economy | 4,5 CR | Dorner, Weinhardt |
| Election block: Supplementary Courses (1 item) | | | |
| T-WIWI-102704 | Facility Location and Strategic Supply Chain Management | 4,5 CR | Nickel |
| T-WIWI-102714 | Tactical and Operational Supply Chain Management | 4,5 CR | Nickel |

Competence Certificate

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

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

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

Competence Goal

The students

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

Prerequisites

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

Content

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

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

Annotation

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

Workload

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

M

6.75 Module: Team Project Management and Technology [M-WIWI-105440]

Responsible: Prof. Dr. Martin Klarmann
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Economics and Management

Part of: [Compulsory Elective Modules \(Team Project\)](#)

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

| Mandatory | | | |
|---------------|--|------|------------------|
| T-WIWI-110968 | Team Project Management and Technology | 9 CR | Klarmann, Mädche |

Competence Certificate

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Competence Goal

After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

Modeled Conditions

The following conditions have to be fulfilled:

1. The module [M-WIWI-105447 - Team Project Management and Technology \(BUS/ENG\)](#) must not have been started.

Content

The team project "Management and Technology" aims to prepare students for working in heterogeneously composed teams. A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.

The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

Workload

The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
 - Team meetings: 30 h (2h per week, 15 weeks),
 - Electronic exchange: 20 h,
 - Final presentation: 10
- Documentation and development:
 - Analysis and design: 70 h,
 - Development: 90 h,
 - Tests and quality assurance: 50 h

M

6.76 Module: Team Project Management and Technology (BUS/ENG) [M-WIWI-105447]

Organisation: KIT Department of Economics and Management

Part of: [Compulsory Elective Modules \(Business Administration oder Engineering Sciences\)](#)

Credits
9

Recurrence
Each term

Language
German/English

Level
3

Version
1

| Mandatory | | | |
|---------------|--|------|------------------|
| T-WIWI-110977 | Team Project Management and Technology (BUS/ENG) | 9 CR | Klarmann, Mädche |

Competence Certificate

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

Competence Goal

After successful completion of the team project, the students can:

- select and apply the methods, techniques and tools required for problem solving
- systematically analyze a given problem in an interdisciplinary team and develop and evaluate an artifact-centered solution
- constructively solve challenges and conflicts that arise in teamwork.

Modeled Conditions

The following conditions have to be fulfilled:

1. The module [M-WIWI-105440 - Team Project Management and Technology](#) must not have been started.

Content

The team project "Management and Technology" is carried out by a business administration or engineering institute. It aims to prepare students for working in heterogeneously composed teams.

A team of 4-5 students will work on defined interdisciplinary questions at the interface of economics and MINT subjects. The result of the projects should typically not only be a presentation or a report, but an artifact, e.g. a method, an algorithm, a model, a software or a component.

The team projects already implement the concept of research-oriented teaching in the Bachelor's degree and aim to build up problem-solving competence in the students.

Workload

The total of 270 working hours (9 credit points) per team member (4-5 members per team) are divided into the following tasks:

- communication:
 - Team meetings: 30 h (2h per week, 15 weeks),
 - Electronic exchange: 20 h,
 - Final presentation: 10
- Documentation and development:
 - Analysis and design: 70 h,
 - Development: 90 h,
 - Tests and quality assurance: 50 h

M

6.77 Module: Technical Logistics [M-MACH-101279]

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

none

Content

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

Workload

270 hours

Learning type

Lecture

M

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

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

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

Content

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

Annotation

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

Workload

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

M

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

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

Organisation: KIT Department of Economics and Management

Part of: Business Administration (Specialisation Program Business Administration)
Compulsory Elective Modules (Business Administration oder Engineering Sciences)
Compulsory Elective Modules (Business Administration)

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

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

Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

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

Content

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

Annotation

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

Workload

The total workload for this module is approximately 270 hours.

M

6.80 Module: Vehicle Development [M-MACH-101265]

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

Part of: Engineering Sciences (Specialisation Program Engineering Sciences)
 Compulsory Elective Modules (Business Administration oder Engineering Sciences)
 Compulsory Elective Modules (Engineering Sciences)

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

| Election block: Vehicle Development (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 | Weber |
| T-MACH-105161 | Fundamentals in the Development of Commercial Vehicles II | 1,5 CR | Weber |
| 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-110796 | Python Algorithm for Vehicle Technology | 4 CR | Rhode |
| T-MACH-105172 | Simulation of Coupled Systems | 4 CR | Geimer, Xiang |
| T-MACH-108888 | Simulation of Coupled Systems - Advance | 0 CR | Geimer, Xiang |
| T-MACH-102148 | Gear Cutting Technology | 4 CR | Klaiber |

Competence Certificate

The assessment is carried out as partial exams.

The partial exams consists of a written exam (90 to 120 minutes) or an oral exam (duration 30 to 40 minutes).

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.


7 Courses





T

7.1 Course: Advanced Lab Blockchain Hackathon (Bachelor) [T-WIWI-111127]

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

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

| Events | | | | | |
|----------|---------|--|-----|------------------------|---|
| WS 20/21 | 2512402 | Practical Course Blockchain Hackathon (Bachelor) | SWS | Practical course (P) / |  Sunyaev, Kannengießer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

T






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





Responsible: Professorenschaft des Fachbereichs Informatik

Organisation: KIT Department of Economics and Management

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

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

| Events | | | | | |
|----------|---------|---|-------|--|---|
| SS 2020 | 2512204 | Lab Business Information Systems: Realisation of innovative services (Bachelor) | 3 SWS | Practical course (P) | Oberweis, Schiefer, Schüler, Toussaint |
| SS 2020 | 2512400 | Development of Sociotechnical Information Systems (Bachelor) | 3 SWS | Practical course (P) | Sunyaev, Sturm |
| SS 2020 | 2512402 | Praktikum Blockchain und Distributed Ledger Technology (Bachelor) | SWS | Practical course (P) | Sunyaev, Beyene, Kannengießer, Pandl |
| SS 2020 | 2512554 | Practical lab Security, Usability and Society (Bachelor) | 3 SWS | Practical course (P) | Volkamer, Strufe, Mayer, Arias Cabarcos, Düzgün |
| WS 20/21 | 2512402 | Practical Course Blockchain Hackathon (Bachelor) | SWS | Practical course (P) /  | Sunyaev, Kannengießer |
| WS 20/21 | 2512501 | Practical Course Cognitive Automobiles and Robots (Master) | 3 SWS | Practical course (P) /  | Zöllner |
| WS 20/21 | 2512600 | Project lab Information Service Engineering (Master) | 2 SWS | Practical course (P) /  | Back |
| WS 20/21 | 2513312 | Seminar Linked Data and the Semantic Web (Bachelor) | 2 SWS | Seminar (S) /  | Färber, Käfer, Heling, Bartscherer |
| WS 20/21 | 2513313 | Seminar Linked Data and the Semantic Web (Master) | 2 SWS | Seminar (S) /  | Färber, Käfer, Heling, Bartscherer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

Annotation

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

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

V

Lab Business Information Systems: Realisation of innovative services (Bachelor) Practical course (P)
2512204, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Content

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

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

Organizational issues

Die genauen Termine und Informationen zur Anmeldung werden auf der Veranstaltungsseite bekannt gegeben.

**Development of Sociotechnical Information Systems (Bachelor)**

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

Practical course (P)**Content**

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

Registration information will be announced on the course page.

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

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

Practical course (P)

Content

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies. This internship will be only in English. The kick-off, the presentations, and every written material to be graded must be in English. Communications with supervisors can be in German.

Important dates:

Kick-off: April 24th, 2020, 14: 00-15: 30 Microsoft Teams - Please, check the WiWi portal

Final submission : 8. September 2020, 23:59

Presentation : 28. September 2020, 14:00

Subjects:

Privacy-friendly apps

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

Topics:

- NoPhish 2.0
- Notes 2.0
- Sudoku 2.0

Programming Usable Security Intervention

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

Topics:

- Password Manager Enrollment Add-On
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- PassSec update
- TORPEDO - web service for different checks
- TORPEDO - Enabling to put identified phishing e-mails into the KIT-spam folder
- Privacy friendly and security friendly marketing analysis tool

Conducting Usable Security User studies (online studies only)

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

Topics:

- Investigating the Corona outbreak impact on privacy and security users' perception.
- Correlation between misconceptions about password security.
- Comparative analysis of several tutorials for TORPEDO.
- Investigating user reactions to Facebook behavioural data collection.
- Usability and adoption of password managers.

Please, note that registration is not required to participate in the kick-off meeting.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php .

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

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

**Practical Course Cognitive Automobiles and Robots (Master)**

2512501, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)
Online

Content

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

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

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

Learning objectives:

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

Recommendations:

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

Workload:

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

Organizational issues

Anmeldung und weitere Informationen sind im Wiwi-Portal zu finden.

Registration and further information can be found in the WiWi-portal.

**Project lab Information Service Engineering (Master)**

2512600, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Practical course (P)
Blended (On-Site/Online)**

Content

The **ISE project course** is based on the summer semester lecture "**Information Service Engineering**". The topics of the ISE project course focus on artificial intelligence based applications. In particular, we are covering the following:

- Natural Language Processing
- Knowledge Graphs
- Deep Learning

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

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

Required coursework includes:

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

Notes:

The 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.

The project course will be restricted to 15 participants.

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

ISE Tutor Team:

- Dr. Mehwish Alam
- Dr. Danilo Dessi
- M. Sc. Genet Asefa Gesese
- M. Sc. Fabian Hoppe
- M. Sc. Zahra Rezaie
- M. Sc. Sasha Vsesviatska
- B. Sc. Tabea Tietz

Organizational issues

Projektpraktikum Information Service Engineering can also be credited as a **seminar**.

**Seminar Linked Data and the Semantic Web (Bachelor)**

2513312, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)
Online**

Content

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

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

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

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

Topics of interest include, but are not limited to:

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

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

**Seminar Linked Data and the Semantic Web (Master)**

2513313, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)
Online**

Content

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

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

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

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

Topics of interest include, but are not limited to:

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



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





T

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

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

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

| Events | | | | | |
|----------|---------|---|-------|--|---|
| SS 2020 | 2512554 | Practical lab Security, Usability and Society (Bachelor) | 3 SWS | Practical course (P) | Volkamer, Strufe, Mayer, Arias Cabarcos, Düzgün |
| WS 20/21 | 2512554 | Practical Course Security, Usability and Society (Bachelor) | 3 SWS | Practical course (P) /  | Volkamer, Strufe, Mayer, Arias Cabarcos, Aldag, Berens, Düzgün, Mossano |
| WS 20/21 | 2512555 | Practical Course Security, Usability and Society (Master) | 3 SWS | Practical course (P) /  | Volkamer, Strufe, Mayer, Arias Cabarcos, Aldag, Berens, Düzgün, Mossano |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

Recommendation

Knowledge from the lecture "Information Security" is recommended.

Annotation

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

Contents:

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

Learning goals:

The student

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

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

V

Practical lab Security, Usability and Society (Bachelor)

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

Practical course (P)

Content

The internship "Security, Usability and Society" will cover topics both of usable security and privacy programming, and how to conduct user studies. This internship will be only in English. The kick-off, the presentations, and every written material to be graded must be in English. Communications with supervisors can be in German.

Important dates:

Kick-off: April 24th, 2020, 14: 00-15: 30 Microsoft Teams - Please, check the WiWi portal

Final submission : 8. September 2020, 23:59

Presentation : 28. September 2020, 14:00

Subjects:

Privacy-friendly apps

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

Topics:

- NoPhish 2.0
- Notes 2.0
- Sudoku 2.0

Programming Usable Security Intervention

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

Topics:

- Password Manager Enrollment Add-On
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- PassSec update
- TORPEDO - web service for different checks
- TORPEDO - Enabling to put identified phishing e-mails into the KIT-spam folder
- Privacy friendly and security friendly marketing analysis tool

Conducting Usable Security User studies (online studies only)

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

Topics:

- Investigating the Corona outbreak impact on privacy and security users' perception.
- Correlation between misconceptions about password security.
- Comparative analysis of several tutorials for TORPEDO.
- Investigating user reactions to Facebook behavioural data collection.
- Usability and adoption of password managers.

Please, note that registration is not required to participate in the kick-off meeting.

This event counts towards the KASTEL certificate. Further information on how to obtain the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php .

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

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

**Practical Course Security, Usability and Society (Bachelor)**

2512554, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

Practical course (P)
Online

Content

The internship "Security, Usability, and Society" covers topics such as user-friendly security and data protection programs as well as the implementation of user studies. The kick-off and the final presentations will be in English. The language of communication with the supervisor can - depending on the topic / supervisor - be German.

Important dates:

Kick-off: (mandatory) 3.11.2020, 10:00-11:30, online. Link: [Microsoft Teams](#)

Final submission: 14.03.2021, 23:59

Presentation: March 14, 2021

Topics:

Privacy-friendly apps

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

- NoPhish 2.0
- Notes 2.0

Programming usable security measures

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

- Password Manager Enrolment Add-On
- Visualization app to explore Facebook behavioral data collection
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Implementation of an anti-phishing browser extension (English only)

Usable security user studies (online studies only)

These topics relate to setting up or analysing the results of user studies of various kinds. This year, due to the Corona outbreak, we decided to only run online studies. Otherwise interviews and laboratory tests would have been possible. At the end of the semester, the students present a report / work and a lecture in which they present their results.

- Investigating user reaction to password data breaches
- Expert feedback for an anti-phishing webpage template (English only)

Please, note that registration is not required to participate in the kick-off meeting.

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

**Practical Course Security, Usability and Society (Master)**

2512555, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

**Practical course (P)
Online**

Content

The internship "Security, Usability, and Society" covers topics such as user-friendly security and data protection programs as well as the implementation of user studies. The kick-off and the final presentations will be in English. The language of communication with the supervisor can - depending on the topic / supervisor - be German.

Important dates:

Kick-off: (mandatory) 3.11.2020, 10:00-11:30, online. Link: [Microsoft Teams](#)

Final submission: 14.03.2021, 23:59

Presentation: March 14, 2021

Topics:

Privacy-friendly apps

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

- NoPhish 2.0
- Notes 2.0

Programming usable security measures

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

- Password Manager Enrolment Add-On
- Visualization app to explore Facebook behavioral data collection
- Portfolio Graphical Recognition-Based Passwords with Gamepads
- Implementation of an anti-phishing browser extension (English only)

Execution of usable security user studies (online studies only)

These topics relate to setting up or analysing the results of user studies of various kinds. This year, due to the Corona outbreak, we decided to only run online studies. Otherwise interviews and laboratory tests would have been possible. At the end of the semester, the students present a report / work and a lecture in which they present their results.

- Investigating user reaction to password data breaches
- Expert feedback for an anti-phishing webpage template (English only)
- Implementing Zero-Trust Authentication Schemes

Please, note that registration is not required to participate in the kick-off meeting.


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





T

7.4 Course: Advanced Lab Sociotechnical Information Systems Development (Bachelor) [T-WIWI-111124]

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

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

| Events | | | | | |
|----------|---------|--|-------|--|----------------|
| WS 20/21 | 2512400 | Practical Course Sociotechnical Information Systems Development (Bachelor) | 3 SWS | Practical course (P) /  | Sunyaev, Pandl |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

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

V

Practical Course Sociotechnical Information Systems Development (Bachelor) Practical course (P) Online

2512400, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

Content

The aim of this course is to provide a practical introduction into developing socio-technical information systems, such as web platforms, mobile apps, or desktop applications. Course participants will create (individually or in groups) software solutions for specific problems from various practical domains. The course tasks comprise requirements assessment, system design, and software implementation. Furthermore, course participants will gain insights into software quality assurance methods and software documentation.

Learning objectives:

- Independent and self-organized realization of a software development project
- Evaluation and selection of suitable development tools and methods
- Application of modern software development methods
- Planning and execution of different development tasks: requirements assessment, system design, implementation, and quality assurance
- Project documentation
- Presentation of project results in an comprehensible and structured form

T




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





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

Organisation: KIT Department of Economics and Management

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

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

| Events | | | | | |
|----------|---------|--|-------|--|--------------------------|
| WS 20/21 | 2511026 | Advanced Programming - Application of Business Software | 2 SWS | Lecture (V) /  | Klink |
| WS 20/21 | 2511027 | Exercises Advanced Programming - Application of Business Software | 1 SWS | Practice (Ü) /  | Klink, Forell, Schreiber |
| WS 20/21 | 2511028 | Computer lab Advanced Programming - Application of Business Software | 2 SWS | Practice (Ü) /  | Forell, Schreiber |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The success control takes place in the form of a written examination. The duration of the exam is 60 minutes in the winter semester 2020/21 and in the summer semester 2021. The examination is offered every semester and can be repeated at any regular examination date.

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

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

Prerequisites

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

Recommendation

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

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

V

Advanced Programming - Application of Business Software

2511026, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

Business information systems enable, support, and accelerate new forms of business processes and forms of organisation. They are the central infrastructure of the economy in the age of eBusiness. Thus, basic knowledge is given in lectures, in excersises and in the computer lab which deals with installation, configuration and parameterization of busines information systems. The course communicates profund knowledge in following topics:

- Analysis of cooperation scenarios and business process scenarios
- Selection of modelling methods according to defined criteria
- Implementation of business process modells and cooperation modells with the help of standard software
- Identification and assessment of challenges during the installation of information systems
- Economical evaluation of business information systems.

This course cannot be taken together with *Advanced Programming - Java Network Programming* [2511020].

Learning objectives:

Students

- explain basic concepts and principles of enterprise information systems,
- describe the components of enterprise information systems,
- assess economical aspects of such systems,
- asseapply standard software for modelling busines processes and for analysing them to given criteria.

Recommendations:

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

Workload:

- Lecture 30h
- Exercise course 17h
- Review and preparation of lectures 23h
- Review and preparation of exercises 10h
- Computer Lab 30h
- Exam preparation 26h
- Exam 1h
- Total 150 h
- Exercise courses are done by student tutors (size about 50 students)

Literature

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

Weitere Literatur wird in der Vorlesung bekannt gegeben.

T

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

Responsible: Prof. Dr. Dietmar Ratz
Prof. Dr.-Ing. Johann Marius Zöllner

Organisation: KIT Department of Economics and Management

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

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

| Events | | | | | |
|---------|---------|---|-------|---------------|------------------------|
| SS 2020 | 2511020 | Advanced Programming - Java Network Programming | 2 SWS | Lecture (V) | Ratz |
| SS 2020 | 2511021 | Tutorium zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java | 1 SWS | Tutorial (Tu) | Ratz, Struppek, Ulrich |
| SS 2020 | 2511023 | Rechnerpraktikum zu Programmierung kommerzieller Systeme - Anwendungen in Netzen mit Java | 2 SWS | | Ratz, Struppek, Ulrich |

Competence Certificate

At the end of the lecture period, a written examination (90 min.) (according to §4(2), 1 SPO) will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

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

Prerequisites

This course cannot be taken together with [Advanced Programming - Application of Business Software](#)[2511026].

Annotation

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

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

V

Advanced Programming - Java Network Programming

2511020, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

In the lecture, the exercises and computer labs to this course the practical handling with the programming language Java dominating within the range of economical applications is obtained. The basis for this is the current language standard. The knowledge from the lecture Introduction to Programming with Java will be deepened and extended. This is done, among other things, by addressing commercially relevant topics such as object-oriented modeling and programming, class hierarchy and inheritance, threads, applications and applets, AWT and Swing components for graphical user interfaces, exception and event processing, lambda expressions, input/output via streams, applications in networks, Internet communication, client and server programming, remote method invocation, servlets, Java Server Pages and Enterprise Java Beans.

This course cannot be taken together with *Advanced Programming - Application of Business Software* [2540886/2590886].

Learning objectives:

- Students learn the practical use of the object-oriented programming language Java and are enabled to design and implement component-based Internet applications using the latest technologies and tools.
- The ability to select and design these methods and systems appropriate to the situation and to use them for solving problems is imparted.
- Students are empowered to find strategic and creative answers in the search for solutions to well-defined, concrete and abstract problems.

Workload:

The total workload for this course is approximately 150 hours.

Organizational issues

Die Anmeldung zur Teilnahme am Rechnerpraktikum (Vorbedingung zur Klausurteilnahme) findet bereits in der ersten Vorlesungswoche statt!

Literature

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

Weiterführende Literatur:

- S. Zakhour, S. Hommel, J. Royal. Das Java Tutorial. Addison Wesley 2007
- W. Eberling, J. Lessner. Enterprise JavaBeans 3. Hanser Verlag 2007.
- R. Oechsle. Parallele und verteilte Anwendungen. 2. Auflage. Hanser Verlag 2007.
- Weitere Literatur wird in der Vorlesung bekannt gegeben.

T

7.7 Course: Advanced Topics in Economic Theory [T-WIWI-102609]

Responsible: Prof. Dr. Kay Mitusch
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101501 - Economic Theory](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Irregular | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-------------------|
| SS 2020 | 2520527 | Advanced Topics in Economic Theory | 2 SWS | Lecture (V) | Mitusch, Scheffel |
| SS 2020 | 2520528 | Übung zu Advanced Topics in Economic Theory | 1 SWS | Practice (Ü) | Pegorari |

Competence Certificate

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

Prerequisites

None

Recommendation

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

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

V

Advanced Topics in Economic Theory

2520527, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Literature

Die Veranstaltung wird in englischer Sprache angeboten:

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

T

7.8 Course: Agile Product Innovation Management - Value-driven Planning of New Products [T-MACH-106744]

Responsible: Hon.-Prof. Dr. Roland Kläger

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 3 |

| Events | | | | | |
|----------|---------|---|-----|------------------------------------|--------|
| WS 20/21 | 2122300 | Agile product innovation management - value-driven planning of new products | SWS | Lecture / Practice (VÜ) / X | Kläger |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Oral examination, 20 min.

Prerequisites

None

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

V

Agile product innovation management - value-driven planning of new products

2122300, WS 20/21, SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
Cancelled

Content

Students are able to

- replicate the essential correlations, procedures and structure elements for the product / innovation planning and to use it as a guideline for the planning of new products
- describe agile innovation processes and the essential prerequisites
- demonstrate the added value of a product in consideration of a system-oriented approach. In addition, they are able to interpret unique selling points (USP)
- deduce the correlation between the added value of superior products and the creativity/innovation
- to apply methods and tools for digital product planning on specific use cases
- explain elements and methods of computer-based ideas management and requirements modeling
- describe the support of the product planning process by RP systems accompanying the development process and select 3D printing processes suitable for specific applications

Literature

Vorlesungsfolien / Lecture slides

T

7.9 Course: Analysis of Social Structures (WiWi) [T-GEISTSOZ-109047]

Responsible: Prof. Dr. Gerd Nollmann

Organisation: KIT Department of Humanities and Social Sciences

Part of: [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|--------------|----------|
| WS 20/21 | 5011007 | Analysis of Social Structures | 2 SWS | Practice (Ü) | Nollmann |

T

7.10 Course: Analysis of Exhaust Gas and Lubricating Oil in Combustion Engines [T-MACH-105173]

Responsible: Dr.-Ing. Marcus Gohl

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|------|
| SS 2020 | 2134150 | Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines | 2 SWS | Lecture (V) | Gohl |

Competence Certificate

Letter of attendance or oral exam (25 minutes, no auxillary means)

Prerequisites

none

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

V

Analysis of Exhaust Gas und Lubricating Oil in Combustion Engines

2134150, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature

Die Vorlesungsunterlagen werden vor jeder Veranstaltung an die Studenten verteilt.

T

7.11 Course: Analysis of Multivariate Data [T-WIWI-103063]

Responsible: Prof. Dr. Oliver Grothe
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101599 - Statistics and Econometrics](#)
[M-WIWI-105414 - Statistics and Econometrics II](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Irregular | 1 |

Competence Certificate

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

Prerequisites

None

Recommendation

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

Annotation

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

T

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

Responsible: Jürgen Pfeil

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-------|
| SS 2020 | 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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature

Skript, erhältlich in der Vorlesung

T

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

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101422 - Specialization in Customer Relationship Management](#)
[M-WIWI-101460 - CRM and Service Management](#)

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

| Events | | | | | |
|---------|---------|---|-------|--------------|--------------|
| SS 2020 | 2540522 | Analytical CRM | 2 SWS | Lecture (V) | Geyer-Schulz |
| SS 2020 | 2540523 | Übungen zu Analytisches CRM | 2 SWS | Practice (Ü) | Schweizer |

Competence Certificate

The exam will be offered for first time writers for the last time in the summer semester 2020.

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

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

Prerequisites

None

Recommendation

We expect knowledge about data models and the UML modelling language concerning information systems.

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

V

Analytical CRM

2540522, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

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

Learning objectives:

The Student

- understands the principal scientific methods from statistics and informatics used in analytical CRM and their application to enterprise decision problems and independently applies these methods to standard cases,
- understands the components for creating and managing a data warehouse from operative system sources including the processes and steps involved and applies these methods to a simple example, and
- uses his knowledge to conduct a standard CRM analysis on enterprise data for a business decision problem and deduces and justifies a recommendation for appropriate action.

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

Exam:

Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation.

The exam is passed, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 5) from exercise work will be added.

Grade: Minimum points

- 1,0: 95
- 1,3: 90
- 1,7: 85
- 2,0: 80
- 2,3: 75
- 2,7: 70
- 3,0: 65
- 3,3: 60
- 3,7: 55
- 4,0: 50
- 5,0: 0

Literature

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

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

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



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


T

7.14 Course: Applied Informatics – Applications of Artificial Intelligence [T-WIWI-110340]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|----------|---------|--|-------|--|-----------------------|
| WS 20/21 | 2511314 | Applied Informatics - Applications of Artificial Intelligence | 2 SWS | Lecture (V) /  | Färber, Käfer |
| WS 20/21 | 2511315 | Exercises to Applied Informatics - Applications of Artificial Intelligence | 1 SWS | Practice (Ü) /  | Färber, Käfer, Nguyen |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written Examination (60 min) according to §4, Abs. 2, 1 of the examination regulations or oral examination of 20 minutes according to §4, Abs. 2, 2 of the examination regulations. The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites

None.

Recommendation

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

Annotation

Replaces from winter semester 2019/2020 T-WIWI-109263 "Applications of Artificial Intelligence".

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

V

Applied Informatics - Applications of Artificial Intelligence

2511314, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

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

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

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

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

Learning objectives:

The students

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

Workload:

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

**Exercises to Applied Informatics - Applications of Artificial Intelligence**

2511315, WS 20/21, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)
Online

Content

The exercises are oriented on the lecture applications of AI.

Multiple exercises are held that capture the topics, held in the lecture Applications of AI and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

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

Learning objectives:

The students

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

T

7.15 Course: Applied Informatics – Database Systems [T-WIWI-110341]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|---------|---------|--|-------|--------------|--------|
| SS 2020 | 2511200 | Applied Informatics - Database Systems | 2 SWS | Lecture (V) | Sommer |
| SS 2020 | 2511201 | Exercises Applied Informatics - Database Systems | 1 SWS | Practice (Ü) | Sommer |

Competence Certificate

The assessment consists of a written exam (60 minutes) in the first week after lecture period.

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-102660 - Database Systems](#) must not have been started.

Annotation

Replaces from summer semester 2020 T-WIWI-102660 "Database Systems".

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

V

Applied Informatics - Database Systems

2511200, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Database systems (DBS) play an important role in today's companies. Internal and external data is stored and processed in databases in every company. The proper management and organization of data helps to solve many problems, enables simultaneous queries from multiple users and is the organizational and operational base for the entire working procedures and processes of the company. The lecture leads in the area of the database theory, covers the basics of database languages and database systems, considers basic concepts of object-oriented and XML databases, conveys the principles of multi-user control of databases and physical data organization. In addition, it gives an overview of business problems often encountered in practice such as:

- Correctness of data (operational, semantic integrity)
- Restore of a consistent database state
- Synchronization of parallel transactions (phantom problem).

Learning objectives:

Students

- are familiar with the concepts and principles of data base models, languages and systems and their applications and explain it,
- design and model relational data bases on the basis of theoretical foundations,
- create queries for relational databases,
- know how to handle enhanced data base problems occurring in the enterprises.

Workload:

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

Literature

- Schlageter, Stucky. Datenbanksysteme: Konzepte und Modelle. Teubner 1983.
- S. M. Lang, P. C. Lockemann. Datenbankeinsatz. Springer-Verlag 1995.
- Jim Gray, Andreas Reuter. Transaction Processing: Concepts and Techniques. Morgan Kaufmann 1993.

Weitere Literatur wird in der Vorlesung bekannt gegeben.

**Exercises Applied Informatics - Database Systems**

2511201, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

Content

Database systems (DBS) play an enormously important role in today's companies. The internal and external data is stored and processed in the database of the respective company. The correct management and organization of this data helps to solve numerous problems, enables simultaneous queries by several users and is the organizational and operational basis for the entire workflows and processes of the company.

The lecture introduces the field of database theory, covers the basics of database languages and database systems, teaches the principles of multi-user database control and physical data organization. In addition, it provides an overview of database problems often encountered in business practice, such as the correctness of data (operational, semantic integrity), the recovery of a consistent database state, and the synchronization of parallel transactions.

Literature

Schlageter / Stucky: Datenbanksysteme: Konzepte und Modelle, 2. Auflage, Teubner, Stuttgart, 1983 P. C. Lockemann / J. W. Schmidt (Hrsg.): Datenbank-Handbuch, Springer-Verlag, 1987 S. Cannan / G. Otten: SQL - The Standard Handbook, McGraw-Hill, 1993 Jim Gray / Andreas Reuter: Transaction Processing: Concepts and Techniques, Morgan Kaufmann, 1993 S. M. Lang / P. C. Lockemann: Datenbankeinsatz, Springer-Verlag, 1995 Ramez Elmasri / Shamkant B. Navathe: Fundamentals of Database Systems, Addison-Wesley, 1994 und 2000

T

7.16 Course: Applied Informatics – Information Security [T-WIWI-110342]

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|---------|---------|---|-------|--------------|------------------|
| SS 2020 | 2511550 | Applied Informatics - Information Security | 2 SWS | Lecture (V) | Volkamer |
| SS 2020 | 2511551 | Exercise Applied Informatics - Information Security | 1 SWS | Practice (Ü) | Volkamer, Berens |

Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation or an oral exam (30 min) following §4, Abs. 2, 2 of the examination regulation.

The exam takes place every semester and can be repeated at every regular examination date.

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-108387 - Information Security](#) must not have been started.

Annotation

Replaces from summer term 2020 [T-WIWI-108387 "Information Security"](#).

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

V

Applied Informatics - Information Security

2511550, SS 2020, 2 SWS, [Open in study portal](#)

Lecture (V)

Content

- Basics and concepts of information security
- Understanding the protection objectives of information security and various attack models (including associated assumptions)
- introduction of measures to achieve the respective protection goals, taking into account different attack models
- Note: In contrast to the IT Security lecture, measures such as encryption algorithms are treated only abstractly, i. e. the idea of the measure, assumptions to the attacker and the deployment environment.
- Presentation and analysis of problems of information security arising from human-machine interaction and presentation of the Human Centered Security by Design approach.
- Introduction into organisational protective measures and standards to be observed for companies

Learning objectives:

The student

- can explain the basics of information security
- knows suitable measures to achieve different protection goals
- can assess the quality of organisational protective measures, i. e. among other things knows what has to be taken into account when using the individual measures
- understands the differences between information security in the organisational and in the private context
- knows the areas of application of different standards and knows their weaknesses
- knows and can explain the problems of information security that which arise from human-machine interaction
- is able to deal with messages concerning found security problems in a critical way.

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php.

Literature

- P. Gerber, M. Ghiglieri, B. Henhapl, O. Kulyk, K. Marky, P. Mayer, B. Reinheimer, and M. Volkamer, *Human Factors in Security*. Springer, Jan. 2018, pp. 83–98.
- C. Eckert, *IT-Sicherheit: Konzepte-Verfahren-Protokolle*. Walter de Gruyter, 2013

**Exercise Applied Informatics - Information Security**

2511551, SS 2020, 1 SWS, [Open in study portal](#)

Practice (Ü)

Content

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php.

T



7.17 Course: Applied Informatics – Modelling [T-WIWI-110338]


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

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|----------|---------|--|-------|--|---------------------------|
| WS 20/21 | 2511030 | Applied Informatics - Modelling | 2 SWS | Lecture (V) /  | Oberweis, Käfer, Schiefer |
| WS 20/21 | 2511031 | Exercises to Applied Informatics - Modelling | 1 SWS | Practice (Ü) /  | Oberweis, Käfer, Schiefer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written examination (60 min) in the first week after lecture period (according to Section 4 (2),1 of the examination regulation).

Prerequisites

None

Annotation

Replaces from winter semester 2019/2020 T-WIWI-102652 "Applied Informatics I - Modeling".

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

V

Applied Informatics - Modelling

2511030, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

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

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

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

Learning objectives:

Students

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

Workload:

- Total effort: 120-135 hours
- Online time: 45 hours
- Self study: 75-90 hours

Organizational issues

Im WS 20/21 gibt es keine festen Vorlesungszeiten, die Vorlesungsinhalte werden in Ilias bereitgestellt.

Literature

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

Weiterführende Literatur:

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

**Exercises to Applied Informatics - Modelling**

2511031, WS 20/21, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)
Online

Content

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

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

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

Learning objectives:

Students

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

Organizational issues

Siehe zugehörige Vorlesung

- Online-Tutorium Dienstag 12-13:30 unter <http://s.kit.edu/ai-m-dienstag>
- Online-Tutorium Mittwoch 10-11:30 unter <http://s.kit.edu/ai-m-mittwoch>
- Online-Tutorium Donnerstag 10-11:30 unter <http://s.kit.edu/ai-m-donnerstag>

Beitritt zum Team unter <http://connect.studium.kit.edu/teams/join/CC30tqrge>

Literature

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

Weiterführende Literatur:

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

T

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

Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|---------|---------|---|-------|--------------|---------|
| SS 2020 | 2511032 | Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services | 2 SWS | Lecture (V) | Sunyaev |
| SS 2020 | 2511033 | Übungen zu Angewandte Informatik - Internet Computing | 1 SWS | Practice (Ü) | Sunyaev |

Competence Certificate

The assessment consists of a written exam (60 min) according to Section 4(2), 1 of the examination regulation. The successful completion of the exercises is recommended for the written exam, which is offered at the end of the winter semester and at the end of the summer semester.

By successful processing the exercises a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites

None

Annotation

Replaces from winter semester 2019/2020 T-WIWI-109445 "Applied Informatics - Internet Computing".

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

V

Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services

Lecture (V)

2511032, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Content

The lecture Applied Computer Science II provides insights into fundamental concepts and future technologies of distributed systems and Internet computing. Students should be able to select, design and apply the presented concepts and technologies. The course first introduces basic concepts of distributed systems (e.g. design of architectures for distributed systems, internet architectures, web services, middleware).

In the second part of the course, emerging technologies of Internet computing will be examined in depth. These include, among others:

- Cloud Computing
- Edge & Fog Computing
- Internet of Things
- Blockchain
- Artificial Intelligence

Learning objectives:

The student learns about basic concepts and emerging technologies of distributed systems and internet computing. Practical topics will be deepened in lab classes.

Recommendations:

Knowledge of content of the module [WI1INFO].

Workload:

The total workload for this course is approximately 135-150 hours.

Literature

Wird in der Vorlesung bekannt gegeben

T

7.19 Course: Applied Informatics – Software Engineering [T-WIWI-110343]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)
[M-WIWI-105112 - Applied Informatics](#)

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

| Events | | | | | |
|---------|---------|---|-------|--------------|-------------------|
| SS 2020 | 2511206 | Applied Informatics - Software Engineering | 2 SWS | Lecture (V) | Oberweis |
| SS 2020 | 2511207 | Übungen zu Angewandte Informatik - Software Engineering | 1 SWS | Practice (Ü) | Oberweis, Fritsch |

Competence Certificate

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

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-WIWI-100809 - Software Engineering](#) must not have been started.

Annotation

Replaces T-WIWI-100809 "Software Engineering" as of summer semester 2020.

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

V

Applied Informatics - Software Engineering

2511206, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course deals with fundamental aspects of the systematic development of huge software systems. The course covers topics such as:

- software developing process models
- methods and tools for the development phases: requirements analysis, system specification, system design, programming and testing.

Learning objectives:

Students

- are familiar with the concepts and principles of software engineering and can discuss it,
- know common software development process models and their strengths and weaknesses and can discuss it,
- know methods for requirements analysis and can use it and can model and evaluate use case models,
- know models for systems structuring and controlling as well as architecture principles of software systems and can discuss it.
- can model and evaluate component diagrams
- are familiar with basic concepts of software quality management and are able to apply software test and evaluation methods in concrete situations.

Workload:

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

Literature

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

Weitere Literatur wird in der Vorlesung bekannt gegeben.

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

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

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

| Events | | | | | |
|---------|---------|---|-------|--------------|--------------|
| SS 2020 | 2560550 | Auction and Mechanism Design | 2 SWS | Lecture (V) | Szech |
| SS 2020 | 2560551 | Übung zu Auction and Mechanism Design | 1 SWS | Practice (Ü) | Szech, Huber |

Competence Certificate

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

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

Prerequisites

None

Recommendation

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

Annotation

The lecture will be held in English.

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

**Auction and Mechanism Design**

2560550, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

The course starts with the basic theory of equilibrium behavior and revenue management in one object standard auctions. The revenue equivalence theorem for standard auctions is introduced. Thereafter, the course focuses on mechanism design and its applications to one object auctions and bilateral trade.

The students

- learn to analyze strategic behavior in auctions;
- learn to compare auction formats with regard to efficiency and revenue;
- are familiarized with the basic theory of (Bayesian) mechanism design;
- learn to master the revenue equivalence theorem for standard auctions;
- learn to apply mechanism design to one object auctions and bilateral trade.

The lecture will be held in English.

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

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

Through successful participation in the Exercise, students can earn a bonus. If the grade on the written exam is between 4,0 and 1,3 the bonus improves the grade by one step (0,3 or 0,4). Details will be announced during the lecture.

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

Recommendations:

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

Literature

Krishna, V.: Auction Theory, Academic Press, 2009.

Milgrom, P.: Putting Auction Theory to Work, Cambridge University Press, 2010.

Mathews, S.: A Technical Primer on Auction Theory I: Independent Private Values No. 1096. Northwestern University, Center for Mathematical Studies in Economics and Management Science, 1995.

**7.21 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Expansion | Language | Version |
|---------------------|---------|------------------|-----------|----------|---------|
| Written examination | 6 | Each winter term | 1 terms | | 3 |

| Events | | | | | |
|----------|---------|--|-------|---------------|-------------------|
| WS 20/21 | 2113805 | Automotive Engineering I | 4 SWS | Lecture (V) / | Gauterin, Unrau |
| WS 20/21 | 2113809 | Automotive Engineering I | 4 SWS | Lecture (V) / | Gauterin, Gießler |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

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.

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

**Automotive Engineering I**

2113805, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
Online**

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

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

Organizational issues

Kann nicht mit der Veranstaltung [2113809] kombiniert werden.

Can not be combined with lecture [2113809].

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.: Scriptum zur Vorlesung "Grundlagen der Fahrzeugtechnik I", KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

**Automotive Engineering I**2113809, WS 20/21, 4 SWS, Language: English, [Open in study portal](#)**Lecture (V)
Online****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

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

Organizational issues

Kann nicht mit LV Grundlagen der Fahrzeugtechnik I [2113805] kombiniert werden.

Can not be combined with lecture [2113805] Grundlagen der Fahrzeugtechnik I.

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.: Scriptum zur Vorlesung 'Automotive Engineering I', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

T


7.22 Course: Automotive Engineering I [T-MACH-102203]


Responsible: Prof. Dr. Frank Gauterin
Dr.-Ing. Martin Gießler

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101266 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-------------------|
| WS 20/21 | 2113809 | Automotive Engineering I | 4 SWS | Lecture (V) /  | Gauterin, Gießler |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written examination

Duration: 120 minutes

Auxiliary means: none

Modeled Conditions

The following conditions have to be fulfilled:

1. The course [T-MACH-100092 - Automotive Engineering I](#) must not have been started.

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

V

Automotive Engineering I

2113809, WS 20/21, 4 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

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

Learning Objectives:

The students know the movements and the forces at the vehicle and are familiar with active and passive safety. They have proper knowledge about operation of engines and alternative drives, the necessary transmission between engine and drive wheels and the power distribution. They have an overview of the components necessary for the drive and have the basic knowledge, to analyze, to evaluate, and to develop the complex system "vehicle".

Organizational issues

Kann nicht mit LV Grundlagen der Fahrzeugtechnik I [2113805] kombiniert werden.

Can not be combined with lecture [2113805] Grundlagen der Fahrzeugtechnik I.

Literature

1. Robert Bosch GmbH: Automotive Handbook, 9th Edition, Wiley, Chichester 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.: Scriptum zur Vorlesung 'Automotive Engineering I', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährlich aktualisiert

**7.23 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|---------|
| SS 2020 | 2114835 | Automotive Engineering II | 2 SWS | Lecture (V) | Unrau |
| SS 2020 | 2114855 | Automotive Engineering II | 2 SWS | Lecture (V) | Gießler |

Competence Certificate

Written Examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites

none

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

**Automotive Engineering II**

2114835, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle bodywork and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

Organizational issues

Kann nicht mit der Veranstaltung [2114855] kombiniert werden.

Can not be combined with lecture [2114855]

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.: Scriptum zur Vorlesung 'Grundlagen der Fahrzeugtechnik II', KIT, Institut für Fahrzeugsystemtechnik, Karlsruhe, jährliche Aktualisierung

**Automotive Engineering II**2114855, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students have an overview of the modules which are necessary for the tracking of a motor vehicle and the power transmission between vehicle and roadway. They have knowledge of different wheel suspensions, tyres, steering elements, and brakes. They know different design versions, functions and the influence on driving and braking behavior. They are able to correctly develop the appropriate components. They are ready to analyze, to evaluate, and to optimize the complex interaction of the different components under consideration of boundary conditions.

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

7.24 Course: Bachelor Thesis [T-WIWI-103067]

Responsible: Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101601 - Module Bachelor Thesis](#)

| Type | Credits | Version |
|--------------|---------|---------|
| Final Thesis | 12 | 1 |

Competence Certificate
see module description

Prerequisites
see module description

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

| | |
|---------------------------------|----------|
| Submission deadline | 6 months |
| Maximum extension period | 1 months |
| Correction period | 6 weeks |

T

7.25 Course: Basic Principles of Economic Policy [T-WIWI-103213]

Responsible: Prof. Dr. Ingrid Ott
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101668 - Economic Policy I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|-----------------|---------|
| Written examination | 4,5 | see Annotations | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|------------------|
| SS 2020 | 2560280 | Basic Principles of Economic Policy | 2 SWS | Lecture (V) | Ott |
| SS 2020 | 2560281 | Exercises of Basic Principles of Economic Policy | 1 SWS | Practice (Ü) | Ott, Scheu, Bälz |

Competence Certificate

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

Prerequisites

None

Recommendation

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

Annotation

Please note that the lecture will not be held in summer semester 2021.

Description:

Theory of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:

Students learn:

- To apply basic concepts of micro- and macroeconomic theories to economic policy issues.
- to develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- to derive theory-based policy recommendations.

Learning content:

- Market interventions: microeconomic perspective
- Market interventions: macroeconomic perspective
- Institutional economic aspects
- Economic policy and welfare economics
- Economic policy makers: Political-economic aspects

Workload:

- Total effort at 4.5 LP: approx. 135 hours
- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

Media:

See course announcement

References:

See course announcement

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



Basic Principles of Economic Policy

2560280, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The lecture deals with theories of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:

Students shall be given the ability to

- apply basic concepts of micro- and macroeconomic theories to economic policy issues
- develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- derive theory-based policy recommendations

Recommendations:

Basic micro- and macroeconomic knowledge is required, especially as taught in the courses Economics I [2610012] and Economics II [2600014].

Workload:

Total effort at 4.5 LP is approx. 135 hours and consists of:

- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

Assessment:

The examination takes place in the form of a written examination (60min) (according to §4(2), 1 SPO). The examination is offered every semester and can be repeated at any regular examination date.

Organizational issues

Zugehörige Veranstaltung: Übungen zur Einführung in die Wirtschaftspolitik [2560281]

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben



Exercises of Basic Principles of Economic Policy

2560281, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

Organizational issues

Zugehörige Veranstaltung: [2560280] Einführung in die Wirtschaftspolitik

Literature

- Klump, Rainer (2013): Wirtschaftspolitik. Pearson Studium
- Baldwin, Richard und Charles Wyplosz (2019): The Economics of European Integration, 6. Edition, McGraw-Hill Education, London
- Foliensatz zur Vorlesung
- Übungsaufgaben

T


7.26 Course: Basics of German Company Tax Law and Tax Planning [T-WIWI-108711]

Responsible: Gerd Gutekunst
Prof. Dr. Berthold Wigger

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101403 - Public Finance](#)
[M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

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

| Events | | | | | |
|----------|---------|---|-------|---|-------------------|
| WS 20/21 | 2560134 | Basics of German Company Tax Law and Tax Planning | 3 SWS | Lecture (V) /  | Wigger, Gutekunst |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

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

Prerequisites

None

Recommendation

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

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

V

Basics of German Company Tax Law and Tax Planning

2560134, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

Workload:

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

Organizational issues

Montag 17:30:00-19:00 Uhr per MS-Teams-Livestream



(Achtung: In der ersten Vorlesungswoche beginnt die Veranstaltung um 18:00 Uhr)



T

7.27 Course: Basics of Mobile Working Machines [T-MACH-110959]

Responsible: Prof. Dr.-Ing. Marcus Geimer
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101267 - Mobile Machines](#)

| Type | Credits | Recurrence | Expansion | Version |
|------------------|---------|------------|-----------|---------|
| Oral examination | 9 | Each term | 2 terms | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|-----------------------|
| SS 2020 | 2114073 | Mobile Machines | 4 SWS | Lecture (V) | Geimer, Lehr |
| WS 20/21 | 2114088 | Übungen zu 'Fluidtechnik' | 2 SWS | Practice (Ü) /  | Geimer, Pult |
| WS 20/21 | 2114093 | Fluid Technology | 2 SWS | Lecture (V) /  | Geimer, Pult, Metzger |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of an oral exam (45 min).

Prerequisites

None

Annotation**Content:**

From the lecture Fluid Power only the hydrostatic topics are required, from the lecture Mobile Machines all topics:

- property of fluids,
- pumps and motors,
- valves,
- hydraulic circuits,
- presentation of the components used and the most important mobile working machines,
- basics and structure of the machines
- practical insights into the development and application of the machines

Media:

- a set of slides for the lectures can be downloaded
- a written script for the lecture Fluid Power
- Book "Grundlagen mobiler Arbeitsmaschinen" (Basics of Mobile Working Machines), Karlsruhe Series of Publications Vehicle System Technology, Volume 22, KIT Scientific Publishing.

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

V

Mobile Machines

2114073, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

- Introduction of the required components and machines
- Basics of the structure of the whole system
- Practical insight in the development techniques

Knowledge in Fluid Power is required.

Recommendations:

It is recommended to attend the course *Fluid Power Systems* [2114093] beforehand.

- regular attendance: 42 hours
- self-study: 184 hours

**Fluid Technology**

2114093, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

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.
- regular attendance: 21 hours
- self-study: 92 hours

Literature

Skriptum zur Vorlesung *Fluidtechnik*
Institut für Fahrzeugsystemtechnik
downloadbar

T


7.28 Course: Basics of Technical Logistics I [T-MACH-109919]


Responsible: Dr.-Ing. Martin Mittwollen
Jan Oellerich

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101279 - Technical Logistics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|-----------------------|
| WS 20/21 | 2117095 | Basics of Technical Logistics | 3 SWS | Lecture / Practice (VÜ) /  | Mittwollen, Oellerich |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

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

Prerequisites

none

Recommendation

Knowledge of the basics of technical mechanics preconditioned.

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

V

Basics of Technical Logistics

2117095, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
Blended (On-Site/Online)

Content

- effect model of conveyor machines
- elements for the change of position and orientation
- conveyor processes
- identification systems
- drives
- mechanical behaviour of conveyors
- structure and function of conveyor machines
- elements of intralogistics
- sample applications and calculations in addition to the lectures inside practical lectures

Students are able to:

- Describe processes and machines of technical logistics,
- Model the fundamental structures and the impacts of material handling machines with mathematical models,
- Refer to industrially used machines
- Model real machines applying knowledge from lessons and calculate their dimensions.

Organizational issues

Die Erfolgskontrolle erfolgt in Form einer mündlichen oder schriftlichen Prüfung (nach §4 (2), 1 bzw. 2SPO).

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

Es wird Kenntnis der Grundlagen der Technischen Mechanik vorausgesetzt.

Basics knowledge of technical mechanics is preconditioned.

Ergänzungsblätter, Präsentationen, Tafel.

Supplementary sheets, presentations, blackboard.

Präsenz: 48Std

Nacharbeit: 132Std

presence: 48h

rework: 132h

Literature


Empfehlungen in der Vorlesung / Recommendations during lessons





T

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

Responsible: Maximilian Hochstein**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101279 - Technical Logistics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|----------------------|
| WS 20/21 | 2117098 | Basics of Technical Logistics II | 3 SWS | Lecture / Practice (VÜ) /  | Hochstein, Oellerich |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

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

Prerequisites

none

Recommendation

Knowledge of the basics of technical mechanics and out of "Basic of Technical Logistics I" (T-MACH-109919) preconditioned.

T

7.30 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II [T-MACH-100967]

Responsible: Prof. Dr. Andreas Guber

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-------|
| SS 2020 | 2142883 | BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II | 2 SWS | Lecture (V) | Guber |

Competence Certificate

Written exam (75 Min.)

Prerequisites

none

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

V

BioMEMS - Microsystems Technologies for Life-Sciences and Medicine II

Lecture (V)

2142883, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Content

Examples of use in Life-Sciences and biomedicine: Microfluidic Systems:

LabCD, Protein Crystallisation

Microarrays

Tissue Engineering

Cell Chip Systems

Drug Delivery Systems

Micro reaction technology

Microfluidic Cells for FTIR-Spectroscopy

Microsystem Technology for Anesthesia, Intensive Care and Infusion

Analysis Systems of Person's Breath

Neurobionics and Neuroprosthesis

Nano Surgery

Organizational issues

Die Vorlesung findet im Sommersemester aufgrund der aktuellen Situation bis auf Weiteres **online** statt. Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.

Die Vorlesung wird voraussichtlich mit der Software ZOOM oder MS Teams zu den im Vorlesungsverzeichnis angekündigten Terminen (hier: Montag 11:30 - 13:00 Uhr) durchgeführt werden. Weitere Informationen werden sobald wie möglich via ILIAS zur Verfügung gestellt.

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

7.31 Course: BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III [T-MACH-100968]

Responsible: Prof. Dr. Andreas Guber

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|--|-------|-------------|-------|
| SS 2020 | 2142879 | BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III | 2 SWS | Lecture (V) | Guber |

Competence Certificate

Written exam (75 Min.)

Prerequisites

none

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

V

BioMEMS - Microsystems Technologies for Life-Sciences and Medicine III

2142879, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Organizational issues

Die Vorlesung findet im Sommersemester aufgrund der aktuellen Situation bis auf Weiteres **online** statt. Zu jedem Vorlesungstermin werden via ILIAS die jeweiligen Folien im PDF-Format zur Verfügung gestellt.

Die Vorlesung wird voraussichtlich mit der Software ZOOM oder MS Teams zu den im Vorlesungsverzeichnis angekündigten Terminen (hier: Montag: 14:00 - 15:30 Uhr) durchgeführt werden. Weitere Informationen werden sobald wie möglich via ILIAS zur Verfügung gestellt.

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

7.32 Course: Bionics for Engineers and Natural Scientists [T-MACH-102172]

Responsible: apl. Prof. Dr. Hendrik Hölscher

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|-------------------|
| SS 2020 | 2142140 | Bionics for Engineers and Natural Scientists | 2 SWS | Lecture (V) | Hölscher, Greiner |

Competence Certificate

written or oral exam

Prerequisites

none

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

V

Bionics for Engineers and Natural Scientists

2142140, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Bionics focuses on the design of technical products following the example of nature. For this purpose we have to learn from nature and to understand its basic design rules. Therefore, the lecture focuses on the analysis of the fascinating effects used by many plants and animals. Possible implementations into technical products are discussed in the end.

The students should be able analyze, judge, plan and develop biomimetic strategies and products.

Basic knowledge in physics and chemistry

The successful attendance of the lecture is controlled by a written examination.

Organizational issues

Die Vorlesung findet im Sommersemester 2020 aufgrund der aktuellen Situation ausschließlich **online** statt. Zu jedem Vorlesungstermin werden folgende Materialien via ILIAS zum Selbststudium zur Verfügung gestellt:

1. Alle Folien zur jeweiligen Vorlesung im PDF-Format
2. Ausgewählte Folien/Themen als Video(s) mit Audiokommentar
3. Übungsaufgaben deren Lösungen jeweils eine Woche später online gestellt werden
4. Ausgewählte Originalartikel zu den Themen der jeweiligen Vorlesung

Zusätzlich gibt es jeweils zum geplanten Termin der Vorlesung ein Webinar (ca. 45 min.). Dies wird voraussichtlich mit der Software Zoom durchgeführt werden. Nähere Informationen werden sobald wie möglich via ILIAS zur Verfügung gestellt.

Literature

Folien und Literatur werden in ILIAS zur Verfügung gestellt.

T


7.33 Course: Boosting of Combustion Engines [T-MACH-105649]




Responsible: Dr.-Ing. Johannes Kech
Dr.-Ing. Heiko Kubach

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|------|
| SS 2020 | 2134153 | Boosting of Combustion Engines | 2 SWS | | Kech |
| WS 20/21 | 2134153 | Boosting of Combustion Engines | 2 SWS | /  | Kech |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam, 20 min

Prerequisites

none

T

7.34 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|------------------------------|-------|-------------|-----------------------|
| SS 2020 | 2114092 | BUS-Controls | 2 SWS | Lecture (V) | Geimer, Daiß, Metzger |

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.

Recommendation

Basic knowledge of electrical engineering is recommended. Programming skills are also helpful.

The number of participants is limited. A registration is 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

2114092, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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)

Basic knowledge of electrical engineering is recommended. Programming skills are also helpful.

- regular attendance: 21 hours
- self-study: 92 hours

Literature**Weiterführende Literatur:**

- 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

7.35 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 0 | Each summer term | 1 |

Competence Certificate

Creation of control program

Prerequisites

none

T



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





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

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101494 - Fundamentals of Business Administration 1](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|-----------------|
| WS 20/21 | 2610026 | Business Administration: Finance and Accounting | 2 SWS | Lecture (V) /  | Ruckes, Wouters |
| WS 20/21 | 2610029 | | 2 SWS | Tutorial (Tu) /  | Strych |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

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

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

Prerequisites

None

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

V

Business Administration: Finance and Accounting

2610026, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture covers the following topics:

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

Literature

Ausführliche Literaturhinweise werden in den Materialien zur Vorlesung gegeben.

T

7.37 Course: Business Administration: Production Economics and Marketing [T-WIWI-102818]

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

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101578 - Fundamentals of Business Administration 2](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|---------------|-------------------------------|
| SS 2020 | 2500025 | Tutorien zu BWL PM | 2 SWS | Tutorial (Tu) | Klarmann, Strych, Assistenten |
| SS 2020 | 2600024 | Business Administration: Production Economics and Marketing | 2 SWS | Lecture (V) | Klarmann, Schultmann |

Competence Certificate

The assessment consists of a written exam (90 minutes) according to Section 4(2), 1 of the examination regulation.

Prerequisites

None

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

V

Business Administration: Production Economics and Marketing

2600024, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course is composed of the sub-areas:

1. Marketing:

Marketing aims at the optimal design of situations that arise in the context of economic activity in the satisfaction of needs and desires (e.g. marketing of company services, soliciting understanding of group interests, distribution of public funds, implementation of economic policy goals).

Topics dealt with in detail:

- Market research (e.g. product positioning, market segmentation)
- behavioural research (e.g. influence of socio-cultural and physical environmental aspects)
- Marketing policy instruments (e.g. product, price, communication and distribution policy),
- Special features of international marketing activities (e.g. advantages and risks in international exchange relations),
- Entrepreneurship and intrapreneurship (e.g. marketing of innovations by company founders vs. established companies)

2. Production Economy:

This subfield provides an initial introduction to all operational tasks related to the production of tangible and intangible goods. In addition to the manufacturing industry (basic and capital goods, capital goods and consumer goods, food and beverages, i.e. production industry in the broadest sense), the energy industry, construction and real estate industry and labour sciences are also considered.

Topics dealt with in detail:

- Introduction to the subfield (system theoretical classification, general tasks, cross-sectional topics)
- Industrial production (location planning, transport planning, procurement, plant management, production management)
- Electricity industry (energy demand and supply, energy system planning, technological foresight, cost structures)
- Construction and real estate industry

3. Information Systems:

Information represents a competitive factor in today's economy, which requires an interdisciplinary view of the research fields of economics, information technology and law. In this subfield, selected fundamentals of Business Information Systems and their role in today's competition are presented.

Examples from practice motivate and complement the topics.

Treated topics in detail:

- Trends in Information Systems
- Definition of terms data, information, knowledge
- Information in companies: Production and competitive factor
- Information processing: from agent to corporate network
- Company networks
- Service Value Networks
- market engineering
- social networks and services

Literature

Ausführliche Literaturhinweise werden gegeben in den Materialien zur Vorlesung.

T

7.38 Course: Business Administration: Strategic Management and Information Engineering and Management [T-WIWI-102817]



Responsible: Prof. Dr. Petra Nieken
Prof. Dr. Martin Ruckes

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101494 - Fundamentals of Business Administration 1](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|------------------------------|
| WS 20/21 | 2600023 | Betriebswirtschaftslehre: Unternehmensführung und Informationswirtschaft | 2 SWS | Lecture (V) /  | Weinhardt, Strych, Lindstädt |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation. The assessment takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

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

V

Betriebswirtschaftslehre: Unternehmensführung und Informationswirtschaft

2600023, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

Foundations of Business Administration

- Economic Principle
- Business administration as science
- Firm and company
- Functions in firms
- Constitutional decisions in firms
- Die curraxit AG - a case study for the core program

Strategic Management

- Mangarial decisions in firms
- Corporate Governance
- Organization of the firm
- Foundations of strategic management

Information Engineering and Management

- Digital economies and services
- Auctions
- Service markets und network effects
- Information processing on financial markets

Learning Outcomes

This lecture introduces the student to the discipline of business administration and management science. Due to this the student is equipped to become familiar with all their different fields very efficiently and effectively. Moreover, this lecture gives some kind of orientation among these fields.

After this, foundations of management and organization as well as information engineering and management are taught.

Literature

Ausführliche Literaturhinweise werden in den Materialien zur Vorlesung gegeben.

T

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

Responsible: Prof. Dr. Wolfgang Müller
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---------------|--------|
| WS 20/21 | 2530299 | Business Strategies of Banks | 2 SWS | Lecture (V) / | Müller |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

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.

Learning outcomes:

Students are in a position to discuss the principles of commercial banking. They are familiar with fundamental concepts of bank management and are able to apply them.

Workload:

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

Literature

Weiterführende Literatur:

- Ein Skript wird im Verlauf der Veranstaltung kapitelweise ausgeteilt.
- Hartmann-Wendels, Thomas; Pfungsten, Andreas; Weber, Martin; 2014, Bankbetriebslehre, 6. Auflage, Springer

T


7.40 Course: CAD-NX Training Course [T-MACH-102187]





Responsible: Prof. Dr.-Ing. Jivka Ovtcharova

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101270 - Product Lifecycle Management](#)

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

| Events | | | | | |
|----------|---------|--|-------|--|-------------------------|
| SS 2020 | 2123357 | CAD-NX training course | 2 SWS | Practical course (P) | Ovtcharova, Mitarbeiter |
| WS 20/21 | 2123357 | CAD-NX training course | 2 SWS | Practical course (P) /  | Ovtcharova, Mitarbeiter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Practical examination on CAD computer, duration: 60 min.

Prerequisites

None

Recommendation

Dealing with technical drawings is required.

Annotation

For the practical course compulsory attendance exists.

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

V

CAD-NX training course

2123357, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

Organizational issues

Das Praktikum wird mehrmals in der vorlesungsfreien Zeit als einwöchige Blockveranstaltung angeboten. Weitere Informationen siehe Homepage des Instituts.

Literature

Praktikumsskript

**CAD-NX training course**2123357, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Practical course (P)
Online****Content**

- Overview of the functional range
- Introduction to the work environment of NX
- Basics of 3D-CAD modelling
- Feature-based modelling
- Freeform modelling
- Generation of technical drawings
- Assembly modelling
- Finite element method (FEM) and multi-body simulation (MBS) with NX

Students are able to:

- create their own 3D geometric models in the CAD system NX and generate drawings due to the created geometry
- carry out FE-studies and kinematic simulations using the integrated CAE tools
- use advanced, knowledge-based functionalities of NX to automate the creation of geometry and thus to ensure the reusability of the models.

Organizational issues

Siehe ILIAS

Literature


Praktikumsskript





T

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

Responsible: Dr. Yvonne Matz
Organisation: KIT Department of Informatics
Part of: [M-INFO-105084 - Public and Civil Law](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 3 |

| Events | | | | | |
|----------|-------|---|-------|---|------|
| WS 20/21 | 24012 | Civil Law for Beginners | 4 SWS | Lecture (V) /  | Matz |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.42 Course: Climatology [T-PHYS-101092]

Responsible: Prof. Dr. Joaquim José Ginete Werner Pinto
Organisation: KIT Department of Physics
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 5 | Each summer term | 3 |

| Events | | | | | |
|---------|---------|---|-------|--------------|--|
| SS 2020 | 4051111 | Klimatologie | 3 SWS | Lecture (V) | Ginete Werner Pinto |
| SS 2020 | 4051112 | Übungen zu Klimatologie | 1 SWS | Practice (Ü) | Ginete Werner Pinto, Ludwig, Mömken |

Prerequisites
none

T


7.43 Course: Combustion Engines I [T-MACH-102194]



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

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101275 - Combustion Engines I](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|------|
| WS 20/21 | 2133113 | Combustion Engines, Hydrogen Engines and CO2 neutral Fuels I | 4 SWS | Lecture / Practice (VÜ) /  | Koch |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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, Hydrogen Engines and CO2 neutral Fuels I

2133113, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
On-Site

Content

Introduction of IFKM and lecture topics
Working Principle and Applications
Characteristic Parameters
Engine Parts
Drive Train
Conventional, alternative and CO2-neutral Fuels
Gasoline Engines
Diesel Engines
Hydrogen Engines
Exhaust Gas Aftertreatment

T

7.44 Course: Combustion Engines II [T-MACH-104609]

Responsible: Dr.-Ing. Rainer Koch
Dr.-Ing. Heiko Kubach

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---------------------------------------|-------|-------------------------|------|
| SS 2020 | 2134151 | Combustion Engines II | 3 SWS | Lecture / Practice (VÜ) | Koch |

Competence Certificate

oral examination, duration: 25 minutes, no auxiliary means

Prerequisites

none

Recommendation

Fundamentals of Combustion Engines I helpful

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

V

Combustion Engines II

2134151, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

T

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

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

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

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.

Annotation

Due to the research semester of Prof. Mitusch the course will not be offered in the winter semester 20/21. An examination will be offered in each semester.

T

7.46 Course: Constitution and Properties of Wearresistant Materials [T-MACH-102141]

Responsible: apl. Prof. Dr. Sven Ulrich

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|-------------|--------|
| SS 2020 | 2194643 | Constitution and Properties of Wear resistant materials | 2 SWS | Lecture (V) | 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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

Teaching 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

regular attendance: 22 hours

self-study: 98 hours

Basic understanding of constitution of wear-resistant materials, of the relations between constitution, properties and performance, of principles of increasing of hardness and toughness of materials as well as of the characteristics of the various groups of wear-resistant materials.

Recommendations: none

Organizational issues

Aufgrund der aktuellen Situation findet die Blockveranstaltung online in folgendem Zeitraum statt:

27.07.-29.07.2020

Montag und Dienstag jeweils von 8:00-19:00 Uhr; Mittwoch von 15:45-19:00 Uhr

Ort: online per MS-Teams

Anmeldung verbindlich bis zum 23.07.2020 unter svен.ulrich@kit.edu.

Nach der Anmeldung wird Ihnen der Link zur Vorlesung per E-Mail mitgeteilt.

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

Kopien der Abbildungen und Tabellen werden verteilt; Copies with figures and tables will be distributed

T

7.47 Course: Construction Technology [T-BGU-101691]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-BGU-101004 - Fundamentals of Construction](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|--|
| SS 2020 | 6200410 | Construction Technology | 3 SWS | Lecture (V) | Gentes, Haghsheno, Schneider |
| SS 2020 | 6200411 | Exercises to Construction Technology | 1 SWS | Practice (Ü) | Gentes, Haghsheno, Schneider, Waleczko |

Competence Certificate

written exam with 90 minutes

Prerequisites

None

Recommendation

None

Annotation

None

T

7.48 Course: Consumer Behavior [T-WIWI-106569]

Responsible: Prof. Dr. Benjamin Scheibehenne
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Once | 2 |

| Events | | | | | |
|---------|---------|--|-------|--------------|-----------------------------|
| SS 2020 | 2572174 | Consumer Behavior | 3 SWS | Lecture (V) | Scheibehenne |
| SS 2020 | 2572176 | Übung zu Consumer Behavior | 1 SWS | Practice (Ü) | Scheibehenne, Oberholzer |

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites

None.

Annotation

For further information, please contact the research group Marketing and Sales (<http://marketing.iism.kit.edu/>).

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

V

Consumer Behavior

2572174, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content**Goal**

The goal of the class is to gain a better understanding of the situational, biological, cognitive, and evolutionary factors that drive consumer behavior. We will address these questions from an interdisciplinary perspective, including relevant theories and empirical research findings from Psychology, Marketing, Cognitive Science, Biology, and Economics.

Description

Consumer decisions are ubiquitous in daily life and they can have long-ranging and important consequences for individual (financial) well-being and health but also for societies and the planet as a whole. To help people making better choices it is important to understand the factors that influence their behavior. Towards this goal, we will explore how consumer behavior is shaped by social influences, situational and cognitive constraints, as well as by emotions, motivations, evolutionary forces, neuronal processes, and individual differences. Across all topics covered in class, we will engage with basic theoretical work as well as with groundbreaking empirical research and current scientific debates.

The lecture will be held in English.

Grading

There will be a written exam at the last day of class. The exam will cover the content of the lecture and the literature listed in the required reading list that will be made available to enrolled students on the first day of class. The exam questions will be in English. You are allowed to bring a language dictionary into the exam but you are not allowed to bring notes.

Workload

The total workload for this course is approximately 135 hours.

Presence time: 30 hours

Preparation and wrap-up of the course: 45 hours

Exam and exam preparation: 60 hours

Comment

This lecture features a “double down” format: There will be two lecture sessions in a row during the first half of the semester. Thus, you will be finished with this class after 7 weeks.

Organizational issues

Die Vorlesung findet einmalig im Sommersemester 2020 statt.

The lecture will only be offered in the summer semester 2020.

Literature

Will be made available to enrolled students on the first day of class.

T

7.49 Course: Control Technology [T-MACH-105185]**Responsible:** Hon.-Prof. Dr. Christoph Gönheimer**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|------------------------------------|-------|-------------|-----------|
| SS 2020 | 2150683 | Control Technology | 2 SWS | Lecture (V) | Gönheimer |

Competence Certificate

Written Exam (60 min)

Prerequisites

none

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

V

Control Technology2150683, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**

Content

The lecture control technology gives an integral overview of available control components within the field of industrial production systems.

The first part of the lecture deals with the fundamentals of signal processing and with control peripherals in the form of sensors and actors which are used in production systems for the detection and manipulation of process states.

The second part handles with the function of electric control systems in the production environment. The main focus in this chapter is laid on programmable logic controls, computerized numerical controls and robot controls. Finally the course ends with the topic of cross-linking and decentralization with the help of bus systems.

The lecture is very practice-oriented and illustrated with numerous examples from different branches.

The following topics will be covered:

- Signal processing
- Control peripherals
- Programmable logic controls
- Numerical controls
- Controls for industrial robots
- Distributed control systems
- Field bus
- Trends in the area of control technology

Learning Outcomes:

The students ...

- are able to name the electrical controls which occur in the industrial environment and explain their function.
- can explain fundamental methods of signal processing. This involves in particular several coding methods, error protection methods and analog to digital conversion.
- are able to choose and to dimension control components, including sensors and actors, for an industrial application, particularly in the field of plant engineering and machine tools. Thereby, they can consider both, technical and economical issues.
- can describe the approach for projecting and writing software programs for a programmable logic control named Simatic S7 from Siemens. Thereby they can name several programming languages of the IEC 1131.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Start: 23.04.2020

Literature**Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

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

T



7.50 Course: Conveying Technology and Logistics [T-MACH-102135]

Responsible: Prof. Dr.-Ing. Kai Furmans
Paolo Pagani

Organisation: KIT Department of Mechanical Engineering

Part of: [M-WIWI-101816 - Seminar Module](#)

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

| Events | | | | | |
|----------|---------|---|-----|---|-----------------|
| SS 2020 | 2119100 | Fördertechnik und Logistiksysteme | SWS | Seminar (S) /  | Furmans, Pagani |
| WS 20/21 | 2119100 | Fördertechnik und Logistiksysteme | SWS | Seminar (S) /  | Furmans, Pagani |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites

none

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

V

Fördertechnik und Logistiksysteme

2119100, SS 2020, SWS, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

The goal of the seminar is to deal with different topics related to the materials handling and logistics. The students can work on the topic either alone or in a group work. At the end the results are presented and discussed with a final presentation. The prepare the work for the seminar an introductory event is scheduled at the beginning.

Organizational issues

Ort: Gebäude 50.38, Raum 0.22, Termine siehe homepage

T

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

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

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

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

T

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

Responsible: Rheza Nakhaeizadeh
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101599 - Statistics and Econometrics](#)
[M-WIWI-105414 - Statistics and Econometrics II](#)

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

| Events | | | | | |
|---------|---------|--|---------|-------------|--------------|
| SS 2020 | 2520375 | Data Mining and Applications | 2/4 SWS | Lecture (V) | Nakhaeizadeh |

Competence Certificate

- Conduction of a larger empirical study in groups
- reporting of milestones
- final presentation (app. 45 minutes)

Prerequisites

None

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

V

Data Mining and Applications

2520375, SS 2020, 2/4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Learning objectives:

Students

- know the definition of Data Mining
- are familiar with the CRISP-DM
- are familiar with the most important Data Mining Algorithms like Decision Tree, K-Means, Artificial Neural Networks, Association Rules, Regression Analysis
- will be able to use a DM-Tool

Content:

Part one: Data Mining:

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

Part two: Examples of application of Data Mining

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

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Exam preparation: 40 hours

Organizational issues

Blockveranstaltung, Termine werden über ILIAS bekannt gegeben

Literature

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

Jiawei Han, Micheline Kamber, *Data Mining : Concepts and Techniques*, 2nd edition, Morgan Kaufmann, ISBN 1558609016 , 2006.

David J. Hand, Heikki Mannila and Padhraic Smyth, *Principles of Data Mining* , MIT Press, Fall 2000

Trevor Hastie, Robert Tibshirani, Jerome Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, Springer Verlag, 2001.

Pang-Ning Tan, Michael Steinbach, Vipin Kumar, *Introduction to Data Mining*, Pearson Addison wesley (May, 2005). Hardcover: 769 pages. ISBN: 0321321367

Ripley, B.D. (1996) *Pattern Recognition and Neural Networks*, Cambridge: Cambridge University Press.

Ian Witten and Eibe Frank, *Data Mining: Practical Machine Learning Tools and Techniques*, 2nd Edition, Morgan Kaufmann, ISBN 0120884070 , 2005.

T 7.53 Course: Decision Theory [T-WIWI-102792]

Responsible: Prof. Dr. Karl-Martin Ehrhart
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101499 - Applied Microeconomics](#)

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

Competence Certificate

The assessment of this course is a written examination (following §4(2), 1 SPO) of 60 mins.
The exam is offered each semester.

Prerequisites

None

Recommendation

Knowledge in mathematics and statistics is required.

T

7.54 Course: Derivatives [T-WIWI-102643]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101402 - eFinance](#)
[M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

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

| Events | | | | | |
|---------|---------|-----------------------------------|-------|--------------|-----------------------|
| SS 2020 | 2530550 | Derivatives | 2 SWS | Lecture (V) | Uhrig-Homburg, Thimme |
| SS 2020 | 2530551 | Übung zu Derivate | 1 SWS | Practice (Ü) | Uhrig-Homburg, Eska |

Competence Certificate

The assessment takes place in the form of a written examination (75 minutes) according to §4(2), 1 SPO. The examination takes place during the semester break. The examination is offered every semester and can be repeated at any regular examination date. A bonus can be acquired through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites

None

Recommendation

None

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

V

Derivatives

2530550, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature

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

Weiterführende Literatur:

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

T

7.55 Course: Design and Operation of Power Transformers [T-ETIT-101925]

Responsible: Prof. Dr.-Ing. Thomas Leibfried
Michael Schäfer

Organisation: KIT Department of Electrical Engineering and Information Technology

Part of: [M-ETIT-101165 - Energy Generation and Network Components](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |



| Events | | | | | |
|---------|---------|--|-------|-----------|---------------|
| SS 2020 | 2307390 | Design and Operation of Power Transformers | 2 SWS | Block (B) | Schäfer, Rink |

T

7.56 Course: Design, Construction and Sustainability Assessment of Buildings I [T-WIWI-102742]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101467 - Design, Construction and Sustainability Assessment of Buildings](#)

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

| Events | | | | | |
|----------|---------|--|-------|--|-------------|
| WS 20/21 | 2586404 | Design and Construction of Buildings | 2 SWS | Lecture (V) /  | Lützkendorf |
| WS 20/21 | 2586405 | Übung zu Bauökologie I | 1 SWS | Practice (Ü) /  | N.N. |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

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

Prerequisites

None

Recommendation

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

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

V

Design and Construction of Buildings

2586404, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

Taking low-energy buildings as an example the course is an introduction to cheap, energy-efficient, resource-saving and health-supporting design, construction and operation of buildings. Questions of the implementation of the principles of a sustainable development within the building sector are discussed on the levels of the whole building, its components, building equipment as well as the materials. Besides technical interrelationships basics dimensioning and various approaches to ecological and economical assessment play a role during the lectures, as well as the different roles of people involved into the building process. Topics are the integration of economical and ecological aspects into the design process, strategies of energy supply, low-energy and passive buildings, active and passive use of solar energy, selection and assessment of construction details, selection and assessment of insulation materials, greened roofs plus health and comfort.

Recommendations:

A combination with the module *Real Estate Management* [WW3BWL01] and with engineering science modules in the area of building physics and structural design is recommended.

The student

- has an in-depth knowledge of aspects of energy-saving, resource-saving and health-oriented design, construction and operation of buildings (design for environment)
- has a critical understanding of the essential requirements, concepts and technical solutions for green buildings
- is able to integrate aspects of energy-saving, resource-saving and health-conscious construction into a holistic environmental design approach and to assess the advantages and disadvantages of different individual solutions.

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

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

Literature**Weiterführende Literatur:**

- Umweltbundesamt (Hrsg.): "Leitfaden zum ökologisch orientierten Bauen". C.F.Müller 1997
- IBO (Hrsg.): "Ökologie der Dämmstoffe". Springer 2000
- Feist (Hrsg.): "Das Niedrigenergiehaus – Standard für energiebewusstes Bauen". C.F.Müller 1998
- Bundesarchitektenkammer (Hrsg.): "Energiegerechtes Bauen und Modernisieren". Birkhäuser 1996
- Schulze-Darup: "Bauökologie". Bauverlag 1996

T

7.57 Course: Design, Construction and Sustainability Assessment of Buildings II [T-WIWI-102743]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101467 - Design, Construction and Sustainability Assessment of Buildings](#)

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

| Events | | | | | |
|---------|---------|--|-------|--------------|-------------|
| SS 2020 | 2585403 | Übung zu Bauökologie II | 1 SWS | Practice (Ü) | Jungmann |
| SS 2020 | 2585404 | Sustainability Assessment of Buildings | 2 SWS | Lecture (V) | Lützkendorf |

Competence Certificate

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

Prerequisites

None

Recommendation

A combination with the module *Real Estate Management* and with engineering science modules from the areas building physics and structural designis recommended.

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

V

Sustainability Assessment of Buildings

2585404, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course identifies problems concerning the economical and environmental assessment of buildings along their lifecycle and discusses suitable procedures and tools supporting the decision making process. For example, the course addresses topics like operating costs, heat cost allocation, comparisons of heating costs, applied economical assessment methods, life cycle assessment as well as related design and assessment tools (e.g. element catalogues, databases, emblems, tools) and assessment procedures (e.g. carbon footprint, MIPS, KEA), which are currently available.

Recommendations:

A combination with the module *Real Estate Management* [WW3BWLOOW2] and with engineering science modules from the areas building physics and structural designis recommended.

The student

- has an in-depth knowledge of the classification of environmental design and construction of buildings within the overall context of sustainability
- has a critical understanding of the main theories and methods of assessing the environmental performance of buildings
- is able to use methods and tools to evaluate the environmental performance in design and decision processes or to interpret existing results

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

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

Literature**Weiterführende Literatur:**

- Schmidt-Bleek: "Das MIPS-Konzept". Droemer 1998
- Wackernagel et.al: "Unser ökologischer Fußabdruck". Birkhäuser 1997
- Braunschweig: "Methode der ökologischen Knappheit". BUWAL 1997
- Hohmeyer et al.: "Social Costs and Sustainability". Springer 1997
- Hofstetter: "Perspectives in Life Cycle Impact Assessment". Kluwer Academic Publishers 1998

T

7.58 Course: Development of hybrid drivetrains [T-MACH-110817]

Responsible: Prof. Dr. Thomas Koch
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-------------------|
| SS 2020 | 2134155 | Development of Hybrid Powertrains | 2 SWS | Lecture (V) | Koch, Doppelbauer |

Competence Certificate
written exam, 1 hour

Prerequisites
None

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

V

Development of Hybrid Powertrains2134155, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

1. Introduction and Goal
2. Alternative Powertrains
3. Fundamentals of Hybrid Powertrains
4. Fundamentals of Electric Components of Hybrid Powertrains
5. Interactions in Hybrid Powertrain Development
6. Overall System Optimization

**7.59 Course: Digital Services [T-WIWI-109938]**

- Responsible:** Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt
- Organisation:** KIT Department of Economics and Management
- Part of:** [M-WIWI-101422 - Specialization in Customer Relationship Management](#)
[M-WIWI-101434 - eBusiness and Service Management](#)
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)
[M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

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

| Events | | | | | |
|---------|---------|---|-------|--------------|---------------------------|
| SS 2020 | 2595466 | Digital Services | 2 SWS | Lecture (V) | Satzger, Weinhardt, Kühl |
| SS 2020 | 2595467 | Exercise Digital Services | 1 SWS | Practice (Ü) | Kühl, Schöffner, Badewitz |

Competence Certificate

The assessment consists of a written exam (60 min) (§4(2), 1 of the examination regulations). By successful completion of the exercises (§4(2), 3 SPO 2007 respectively §4(3) SPO 2015) a bonus can be obtained. If the grade of the written exam is at least 4.0 and at most 1.3, the bonus will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites

see below

Annotation

This course replaces T-WIWI-105771 "Foundations of Digital Services A" as of winter semester 2019/2020.

Students who wish to register for the examination in the summer semester 2019 please select the examination "Foundations of Digital Services A".

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

**Digital Services**

2595466, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

The world has been moving towards "service-led" economies: In many developed countries, services already account for more than 70% of the gross domestic product. In order to design, engineer, and manage services, traditional "goods-oriented" business models are often inappropriate. At the same time, the rapid development of information and communication technology (ICT) pushes "servitization" and the economic importance of digital services and, therefore, drives competition: Increased interaction and individualization options open up new dimensions of "value co-creation" between providers and customers; dynamic and scalable service value networks replace static value chains; services can instantly be delivered anywhere across the globe.

Building on a systematic categorization of different types of services and on the general notion of "value co-creation", we cover concepts and foundations for engineering and managing ICT-based digital services, allowing for further specialization in other KSRI/IISM courses at the Master level. Topics in this course include an introduction to services, cloud and cloud labor services, web services, service innovation, service analytics, digital economics, as well as the transformation and coordination of service value networks. Additionally, case studies, hands-on exercises, and guest lectures will illustrate the relevance of digital services in today's world. This course is held in English to acquaint students with international environments.

Literature

- Beverungen, D., Müller, O., Matzner, M., Mendling, J., & Vom Brocke, J. (2019). Conceptualizing smart service systems. *Electronic Markets*, 29(1), 7-18.
- Böhmman, T., Leimeister, J. M., & Möslin, K. (2014). Service systems engineering. *Business & Information Systems Engineering*, 6(2), 73-79.
- Cardoso, J., Fromm, H., Nickel, S., Satzger, G., Studer, R., & Weinhardt, C. (Eds.). (2015). *Fundamentals of service systems* (Vol. 12). Heidelberg: Springer.
- Davenport, T., & Harris, J. (2017). *Competing on analytics: Updated, with a new introduction: The new science of winning*. Harvard Business Press.
- Fromm, H., Habryn, F., & Satzger, G. (2012). Service analytics: Leveraging data across enterprise boundaries for competitive advantage. In *Globalization of professional services* (pp. 139-149). Springer, Berlin, Heidelberg.
- Ostrom, A. L., Parasuraman, A., Bowen, D. E., Patrício, L., & Voss, C. A. (2015). Service research priorities in a rapidly changing context. *Journal of Service Research*, 18(2), 127-159.
- Schüritz, R., & Satzger, G. (2016). Patterns of data-infused business model innovation. In *2016 IEEE 18th Conference on Business Informatics (CBI)* (Vol. 1, pp. 133-142). IEEE.
- Spohrer, J., Maglio, P. P., Bailey, J., & Gruhl, D. (2007). Steps toward a science of service systems. *Computer*, 40(1), 71-77.

T


7.60 Course: Digitalization from Production to the Customer in the Optical Industry [T-MACH-110176]





Responsible: Marc Wawerla

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|---|---------|
| WS 20/21 | 2149701 | Digitalization from Production to the Customer in the Optical Industry | 2 SWS | Lecture (V) /  | Wawerla |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative test achievement (graded):

- Processing and presentation (ca. 30 min) of a case study with weighting 50%
- Written exam (ca. 60 min) with weighting 50%

Prerequisites

none

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

V

Digitalization from Production to the Customer in the Optical Industry

2149701, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture deals with Digitalization along the entire value chain end-to-end, with a focus on production and supply chain. Within this context, concepts, tools, methods, technologies and concrete applications in the industry are presented. Furthermore, the students get the opportunity to get first-hand insights into the digitalization journey of a German technology company.

Main topics of the lecture:

- Concepts and methods such as disruptive innovation and agile project management
- Overview on technologies at disposal
- Practical approaches in innovation
- Applications in industry
- Field trip to ZEISS

Learning Outcomes:

The students ...

- are capable to comment on the content covered by the lecture.
- are able to analyze and evaluate the suitability of digitalization technologies in the optical industry.
- are able to assess the applicability of methods such as disruptive innovation and agile project management.
- are able to appreciate the practical challenges to digitalization in industry.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>)

Aufgrund der begrenzten Teilnehmerzahl ist eine Voranmeldung erforderlich.

For organisational reasons, the number of participants for the course is limited. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/studium-und-lehre.php>).



Due to the limited number of participants, advance registration is required.





T

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

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

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

| Events | | | | | |
|----------|---------|---|-------|--|----------------------|
| WS 20/21 | 2560137 | Economics and Behavior | 2 SWS | Lecture (V) /  | Szech, Ehrlich, Zhao |
| WS 20/21 | 2560138 | Übung zu Economics and Behavior | 1 SWS | Practice (Ü) /  | Szech, Zhao, Huber |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The exam form in winter term 20/21 cannot be determined yet due to the Corona pandemic.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Recommendation

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

Annotation

The lecture will be held in English.

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

V

Economics and Behavior

2560137, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

The course covers topics from behavioral economics with regard to contents and methods. In addition, the students gain insight into the design of economic experiments. Furthermore, the students will become acquainted with reading and critically evaluating current research papers in the field of behavioral economics.

The students

- gain insight into fundamental topics in behavioral economics;
- get to know different research methods in the field of behavioral economics;
- learn to critically evaluate experimental designs;
- get introduced to current research papers in behavioral economics;
- become acquainted with the technical terminology in English.

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

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

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

The lecture will be held in English.

Recommendations:

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

Literature

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

Ariely, Dan: Predictably Irrational. New York: HarperCollins, 2008.

Ariely, Dan: The Upside of Irrationality. New York: HarperCollins 2011.

T


7.62 Course: Economics I: Microeconomics [T-WIWI-102708]

Responsible: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-100950 - Preliminary Exam](#)
[M-WIWI-101398 - Introduction to Economics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|------|
| WS 20/21 | 2610012 | Economics I: Microeconomics | 3 SWS | Lecture (V) /  | Reiß |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.

The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. As a rule, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

Prerequisites

None

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

V

Economics I: Microeconomics

2610012, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
On-Site**

Content

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

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

It is the main aim of this course to provide basic knowledge in economic modelling. In particular, the student should be able to analyze market processes and the determinants of market results. Furthermore, she should be able to evaluate the effects of economic policy measures on market behavior and propose alternative, more effective policy measures.

In particular, the student should learn

- to apply simple microeconomic concepts,
- to analyze the structure of real world economic phenomena,
- to judge the possible effects of economic policy measures on the behavior of economic agents (in simple decision problems),
- to suggest alternative policy measures,
- to analyze as a participant of a tutorial simple economic problems by solving written exercises and to present the results of the exercises on the blackboard,
- to become familiar with the basic literature on microeconomics.

The student should gain basic knowledge in order to help in practical problems

- to analyze the structure of microeconomics relationships and to present own problem solutions,
- solve simple economic decision problems.

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation. The main exam takes place subsequent to the lecture.

The re-examination is offered at the same examination period. Usually, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

The total workload for this course is approximately 150 hours.

Literature

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

T

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

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101398 - Introduction to Economics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|---------------|------------------|
| SS 2020 | 2600014 | Economics II: Macroeconomics | 4 SWS | Lecture (V) | Scheffel |
| SS 2020 | 2660015 | Economics II : Macroeconomics, Tutorial | 2 SWS | Tutorial (Tu) | Scheffel, Krause |

Competence Certificate

The assessment consists of a written exam (120 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites

None

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

V

Economics II: Macroeconomics

2600014, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content**Classical Theory of Macroeconomic Production**

Chapter 1: Gross domestic product

Chapter 2: Money and Inflation

Chapter 3: Open Economy I

Chapter 4: Unemployment

Growth: The economy in the long term

Chapter 5: Growth I

Chapter 6: Growth II

Business cycle: The economy in the short term

Chapter 7: Economy and aggregate demand I

Chapter 8: Economy and aggregate demand II

Chapter 9: Open Economy II

Chapter 10: Macroeconomic supply

Advanced topics of macroeconomics

Chapter 11: Dynamic model of the economy as a whole

Chapter 12: Microeconomic foundations

Chapter 13: Macroeconomic economic policy

Learning goals:

The students. . .

- can name the basic indicators, technical terms and concepts of macroeconomics.
- can use models to reduce complex relationships to their basic components.
- can analyse economic policy debates and form their own opinion on them.

Workload:

Total effort for 5 credit points: approx. 150 hours

Presence time: 45 hours

Before and after the LV: 67.5 hours

Exam and exam preparation: 37.5 hours

Literature

Als Grundlage dieser Veranstaltung dient das bekannte Lehrbuch „Makroökonomik“ von Greg Mankiw vom Schäffer Poeschel Verlag in der aktuellen Fassung.

T

7.64 Course: Economics III: Introduction in Econometrics [T-WIWI-102736]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101499 - Applied Microeconomics](#)
[M-WIWI-101599 - Statistics and Econometrics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|----------------|
| SS 2020 | 2520016 | Economics III: Introduction to Econometrics | 2 SWS | Lecture (V) | Schienle |
| SS 2020 | 2520017 | Übungen zu VWL III | 2 SWS | Practice (Ü) | Schienle, Buse |

Competence Certificate

The assessment consists of an 1h written exam according to Section 4(2), 1 of the examination regulation.

Prerequisites

None

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

V

Economics III: Introduction to Econometrics

2520016, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content**Learning objectives:**

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

Content:

- Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)
- Model assessment

Requirements:

Knowledge of the lectures Statistics I + II is required.

Workload:

Total workload for 5 CP: approx. 150 hours

Attendance: 30 hours

Preparation and follow-up: 120 hours

Literature

Von Auer: Ökonometrie ISBN 3-540-00593-5

Goldberger: A course in Econometrics ISBN 0-674-17544-1

Gujarati. Basic Econometrics ISBN 0-07-113964-8



Schneeweiß: Ökonometrie ISBN 3-7908-0008-2

T

7.65 Course: eFinance: Information Systems for Securities Trading [T-WIWI-110797]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101402 - eFinance](#)
[M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101434 - eBusiness and Service Management](#)
[M-WIWI-101465 - Topics in Finance I](#)
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

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

| Events | | | | | |
|----------|---------|---|-------|--|----------------------|
| WS 20/21 | 2540454 | eFinance: Information Systems for Securities Trading | 2 SWS | Lecture (V) /  | Weinhardt, Notheisen |
| WS 20/21 | 2540455 | Übungen zu eFinance: Informationssysteme für den Wertpapierhandel | 1 SWS | Practice (Ü) /  | Jaquart |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

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

Prerequisites

see below

Annotation

The course "eFinance: Information Systems for Securities Trading" covers different actors and their function in the securities industry in-depth, highlighting key trends in modern financial markets, such as Distributed Ledger Technology, Sustainable Finance, and Artificial Intelligence. Security prices evolve through a large number of bilateral trades, performed by market participants that have specific, well-regulated and institutionalized roles. Market microstructure is the subfield of financial economics that studies the price formation process. This process is significantly impacted by regulation and driven by technological innovation. Using the lens of theoretical economic models, this course reviews insights concerning the strategic trading behaviour of individual market participants, and models are brought market data. Analytical tools and empirical methods of market microstructure help to understand many puzzling phenomena in securities markets.

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

V

eFinance: Information Systems for Securities Trading

2540454, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

The course "eFinance: Information Systems for Securities Trading" covers different actors and their function in the securities industry in-depth, highlighting key trends in modern financial markets, such as Distributed Ledger Technology, Sustainable Finance, and Artificial Intelligence. Security prices evolve through a large number of bilateral trades, performed by market participants that have specific, well-regulated and institutionalized roles. Market microstructure is the subfield of financial economics that studies the price formation process. This process is significantly impacted by regulation and driven by technological innovation. Using the lens of theoretical economic models, this course reviews insights concerning the strategic trading behaviour of individual market participants, and models are brought market data. Analytical tools and empirical methods of market microstructure help to understand many puzzling phenomena in securities markets.

Literature

- Maureen O'Hara: Market Microstructure Theory (1997, Blackwell Publishing)
- Larry Harris: Trading and Exchanges – Market Microstructure for Practitioners (2004, Oxford University Press)

Further Literature

- Joel Hasbrouck: Empirical Market Microstructure (2007, Oxford University Press)
- Thierry Foucault, Marco Pagano, and Ailsa Roell: Market Liquidity: Theory, Evidence, and Policy (2013, Oxford University Press)

T

7.66 Course: Electric Energy Systems [T-ETIT-101923]

Responsible: Prof. Dr.-Ing. Thomas Leibfried
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [M-ETIT-102379 - Power Network](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|-----------|
| SS 2020 | 2307391 | Electric Energy Systems | 2 SWS | Lecture (V) | Leibfried |
| SS 2020 | 2307393 | Übungen zu 2307391 Elektroenergiesysteme | 1 SWS | Practice (Ü) | Steinle |



Prerequisites
none

T

7.67 Course: Electrical Engineering for Business Engineers, Part I [T-ETIT-100533]

Responsible: Dr. Wolfgang Menesklou**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-ETIT-101155 - Electrical Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|-----------|
| WS 20/21 | 2304223 | Electrical Engineering for Business Engineers, Part I | 2 SWS | Lecture (V) /  | Menesklou |
| WS 20/21 | 2304225 | Electrical Engineering for Business Engineers, Part I (Tutorial to 2304223) | 2 SWS | Practice (Ü) /  | Menesklou |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.68 Course: Electrical Engineering for Business Engineers, Part II [T-ETIT-100534]

Responsible: Dr. Wolfgang Menesklou
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-----------|
| SS 2020 | 2304224 | Elektrotechnik II für Wirtschaftsingenieure | 3 SWS | Lecture (V) | Menesklou |

T


7.69 Course: Energy Conversion and Increased Efficiency in Internal Combustion Engines [T-MACH-105564]





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

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101275 - Combustion Engines I](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|------|
| WS 20/21 | 2133121 | Energy Conversion and Increased Efficiency in Internal Combustion Engines and Hydrogen Engines | 2 SWS | Lecture (V) /  | Koch |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 and Hydrogen Engines

Lecture (V)
On-Site

2133121, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Content

Introduction

Thermodynamics of combustion engines

Fundamentals

gas exchange

Flow field

Wall heat losses

Combustion in gasoline engines

Pressure Trace Analysis

Combustion in Diesel engines

Specific Topics of Hydrogen Combsution

Waste heat recovery

T

7.70 Course: Energy Policy [T-WIWI-102607]

Responsible: Prof. Dr. Martin Wietschel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101464 - Energy Economics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each summer term | 3 |

| Events | | | | | |
|---------|---------|-------------------------------|-------|-------------|-----------|
| SS 2020 | 2581959 | Energy Policy | 2 SWS | Lecture (V) | Wietschel |

Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation.

Prerequisites

None.

Below you will find excerpts from events related to this course:

V

Energy Policy

2581959, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)**Content**

The availability of cheap, environmentally friendly and secure energy is crucial for human welfare. However, the increasing scarcity of resources and increasing environmental pressures, with a particular focus on climate change, threaten human welfare through economic action. Energy contributes significantly to environmental pollution. The energy industry is characterised by high regulation and a significant influence of political decisions.

At the beginning of the lecture different perspectives on energy policy will be presented and the analysis of political decision-making processes will be discussed. Then the current energy policy challenges in the area of environmental pollution, regulation and the role of energy for households and industry will be discussed. Then the actors of energy policy and energy responsibilities in Europe will be discussed. The economic approaches from traditional environmental economics and sustainability as a new policy approach will then be discussed. Finally, energy policy instruments such as the promotion of renewable energies or energy efficiency are discussed in detail and how they can be evaluated.

The lecture emphasizes the relationship between theory and practice and presents some case studies.

Literature

Wird in der Vorlesung bekannt gegeben.

T

7.71 Course: Engine Measurement Techniques [T-MACH-105169]

Responsible: Dr.-Ing. Sören Bernhardt
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-----------|
| SS 2020 | 2134137 | 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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature

1. Grohe, H.: Messen an Verbrennungsmotoren
2. Bosch: Handbuch Kraftfahrzeugtechnik
3. Veröffentlichungen von Firmen aus der Meßtechnik
4. Hoffmann, Handbuch der Meßtechnik
5. Klingenberg, Automobil-Meßtechnik, Band C

T

7.72 Course: Exam on Climatology [T-PHYS-105594]

Responsible: Prof. Dr. Joaquim José Ginete Werner Pinto
Organisation: KIT Department of Physics
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 1 | Each summer term | 4 |



T

7.73 Course: Facility Location and Strategic Supply Chain Management [T-WIWI-102704]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101413 - Applications of Operations Research](#)
[M-WIWI-101414 - Methodical Foundations of OR](#)
[M-WIWI-101421 - Supply Chain Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 4 |

| Events | | | | | |
|----------|---------|---|-------|--|--------|
| WS 20/21 | 2550486 | Facility Location and Strategic Supply Chain Management | 2 SWS | Lecture (V) /  | Nickel |
| WS 20/21 | 2550487 | Übungen zu Standortplanung und strategisches SCM | 1 SWS | Practice (Ü) /  | Pomes |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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.

Prerequisite for admission to examination is the successful completion of the online assessments.

Prerequisites

Prerequisite for admission to examination is the successful completion of the online assessments.

Recommendation

None

Annotation

The lecture is held in every winter term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V

Facility Location and Strategic Supply Chain Management

2550486, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Literature

Weiterführende Literatur:

- 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


7.74 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-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|------------------|
| WS 20/21 | 2181711 | Failure of structural materials: deformation and fracture | 3 SWS | Lecture / Practice (VÜ) /  | Gumbsch, Weygand |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
Online

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 elastic fracture mechanics
 - crack resistance
 - experimental measurement of fracture toughness
 - defect measurement
 - crack propagation
 - application of fracture mechanics
 - atomistics of fracture

The student

- has the basic understanding of mechanical processes to explain the relationship between externally applied load and materials strength.
- can explain the foundation of linear elastic fracture mechanics and is able to determine if this concept can be applied to a failure by fracture.
- can describe the main empirical materials models for deformation and fracture and can apply them.
- has the physical understanding to describe and explain phenomena of failure.

preliminary knowledge in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours

self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

Organizational issues

Übungstermine werden in der Vorlesung bekannt gegeben!

Literature

- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe

T


7.75 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-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-----------------|
| WS 20/21 | 2181715 | Failure of Structural Materials: Fatigue and Creep | 2 SWS | Lecture (V) /  | Gruber, Gumbsch |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral exam ca. 30 minutes

no tools or reference materials

Prerequisites

none

Recommendation

preliminary knowledge 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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content**1 Fatigue**

1.1 Introduction

1.2 Lifetime

1.3 Fatigue Mechanisms

1.4 Material Selection

1.5 Notches and Shape Optimization

1.6 Case Studies: ICE-Accidents

2 Creep

2.1 Introduction

2.2 High Temperature Plasticity

2.3 Phänomenological Description of Creep

2.4 Creep Mechanisms

2.5 Alloying Effects

The student

- has the basic understanding of mechanical processes to explain the relationships between externally applied load and materials strength.
- can describe the main empirical materials models for fatigue and creep and can apply them.
- has the physical understanding to describe and explain phenomena of failure.
- can use statistical approaches for reliability predictions.
- can use its acquired skills, to select and develop materials for specific applications.

preliminary knowledge in mathematics, mechanics and materials science recommended

regular attendance: 22,5 hours

self-study: 97,5 hours

The assessment consists of an oral examination (ca. 30 min) according to Section 4(2), 2 of the examination regulation.

Organizational issues

Die Vorlesung findet zum angekündigten Termin online statt. Die Vorlesung wird parallel aufgezeichnet. Die Videos und Vorlesungsfolien werden auf KIT-ILIAS bereitgestellt. Der Zugang zu MS Teams und weitere Informationen zur Organisation und Interaktion werden auf ILIAS bekannt gegeben. Die Anmeldung zum ILIAS-Kurs kann direkt bis zum 30.11.2020 erfolgen. Bei Fragen wenden Sie sich bitte jederzeit an patric.gruber@kit.edu.

Literature



- Engineering Materials, M. Ashby and D.R. Jones (2nd Edition, Butterworth-Heinemann, Oxford, 1998); sehr lesenswert, relativ einfach aber dennoch umfassend, verständlich
- Mechanical Behavior of Materials, Thomas H. Courtney (2nd Edition, McGraw Hill, Singapur); Klassiker zu den mechanischen Eigenschaften der Werkstoffe, umfangreich, gut
- Bruchvorgänge in metallischen Werkstoffen, D. Aurich (Werkstofftechnische Verlagsgesellschaft Karlsruhe), relativ einfach aber dennoch umfassender Überblick für metallische Werkstoffe
- Fatigue of Materials, Subra Suresh (2nd Edition, Cambridge University Press); Standardwerk über Ermüdung, alle Materialklassen, umfangreich, für Einsteiger und Fortgeschrittene





T

7.76 Course: Financial Accounting and Cost Accounting [T-WIWI-102816]

Responsible: Dr. Jan-Oliver Strych
Organisation: KIT Department of Informatics
 KIT Department of Economics and Management
Part of: [M-WIWI-101578 - Fundamentals of Business Administration 2](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|--------|
| WS 20/21 | 2600002 | | 2 SWS | Lecture (V) /  | Strych |
| WS 20/21 | 2600003 | Übung zu Rechnungswesen | 2 SWS | Practice (Ü) /  | Strych |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam following §4, Abs. 2, 1 of the examination regulation.
 The examination takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

2600002, WS 20/21, 2 SWS, [Open in study portal](#)

Lecture (V)
Online

Literature



Coenenberg, Haller und Schultze (2014): Jahresabschluss und Jahresabschlussanalyse, 23. Auflage. Stuttgart: Schäffer-Poeschel.
 Hawawini and Viallet (2011): Finance for Executives: Managing for Value Creation. South-Western Cengage Learning.





T

7.77 Course: Financial Accounting for Global Firms [T-WIWI-107505]

Responsible: Dr. Torsten Luedecke
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|----------|
| WS 20/21 | 2530242 | Financial Accounting for Global Firms | 2 SWS | Lecture (V) /  | Luedecke |
| WS 20/21 | 2530243 | Tutorial - Financial Accounting for Global Firms | 1 SWS | Practice (Ü) /  | Luedecke |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites

None

Recommendation

Basic knowledge in corporate finance and accounting.

Annotation

New lecture in the winter term 2017/18.

Below you will find excerpts from events related to this course:

V

Financial Accounting for Global Firms

2530242, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

Increasing globalization coupled with related regulations continues to put pressure on moving towards a common global accounting framework - International Financial Reporting Standards (IFRS). Currently, more than 140 countries use IFRS, so if a firm's business include global transactions, it is critical to know about the impact of IFRS on the financial reporting process and business. In the EU, IFRS are compulsory for listed companies's consolidated statements but have also gained factual significance for companies without statutory duty to use IFRS. The course introduces the conceptual framework of IFRS, discuss the primary financial statements according to IFRS and explains the underlying principles, concepts, and methods to prepare the financial statements. Special focus is given to some more complex accounting issues related to revenue recognition from contracts with customers, consolidation of different types of intercorporate investments, and foreign currency translation.

The lecture covers the following topics:

- The context of financial accounting for global firms
- The mechanics of financial accounting
- Accounting frameworks and concepts
- Content and presentation of financial statements
- Preparing financial statements
- Revenue recognition from contracts
- Tangible and intangible non-current assets
- Financial assets, liabilities, and equity
- Consolidation and the assessment of control
- Investment in associates and joint arrangements
- Business combinations
- Foreign currency translation

Learning outcomes: Students

- understand the IFRS conceptual framework and its significance for global firms,
- are able to read and interpret IFRS compliant financial statements,
- know about key differences between IFRS and U.S. GAAP and its impact on financial reporting,
- can apply the multi-step model for the recognition of revenues from contracts with customers,
- are able to evaluate alternative measurement bases for assets and liabilities,
- are able to classify intercorporate investments by the concept of control and to apply the appropriate accounting method,
- know about the impact of foreign exchange translation on financial statements.

Organizational issues

Zur Vorlesung wird eine 14-tägige Übung angeboten.

Literature

Alexander, D. and C. Nobes (2020): Financial Accounting – An International Introduction, 7th ed., Pearson.

Coenenberg, A.G., Haller, A. und W. Schultze (2018): Jahresabschluss und Jahresabschlussanalyse, 25. Auflage. Schäffer-Poeschel Verlag Stuttgart.

T

7.78 Course: Financial Econometrics [T-WIWI-103064]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101599 - Statistics and Econometrics](#)
[M-WIWI-105414 - Statistics and Econometrics II](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Irregular | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|------------------|
| SS 2020 | 2520022 | Financial Econometrics | 2 SWS | Lecture (V) | Schienle |
| SS 2020 | 2520023 | Übungen zu Financial Econometrics I | 2 SWS | Practice (Ü) | Schienle, Görden |

Competence Certificate

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites

None

Recommendation

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics"[2520016]

Annotation

The course takes place each second summer term: 2018/2020....

Below you will find excerpts from events related to this course:

V

Financial Econometrics

2520022, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content**Learning objectives:**

The student

- shows a broad knowledge of financial econometric estimation and testing techniques
- is able to apply his/her technical knowledge using software in order to critically assess empirical problems

Content:

ARMA, ARIMA, ARFIMA, (non)stationarity, causality, cointegration, ARCH/GARCH, stochastic volatility models, computer based exercises

Requirements:

It is recommended to attend the course *Economics III: Introduction to Econometrics* [2520016] prior to this course.

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

Exam preparation: 40 hours

Literature

Taylor, S. J. (2005): "Asset Price Dynamics, Volatility, and Prediction", Princeton University Press.

Tsay, R. S. (2005): "Analysis of Financial Time Series: Financial Econometrics", Wiley, 2nd edition.

Cochrane, J. H. (2005): "Asset Pricing", revised edition, Princeton University Press.

Campbell, J. Y., A. W. Lo, and A. C. MacKinlay (1997): "The Econometrics of Financial Markets", Princeton University Press.

Hamilton, J. D. (1994): "Time Series Analysis", Princeton University Press.



Additional literature will be discussed in the lecture.





T

7.79 Course: Financial Econometrics II [T-WIWI-110939]

Responsible: Prof. Dr. Melanie Schienle
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101599 - Statistics and Econometrics](#)
[M-WIWI-105414 - Statistics and Econometrics II](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|-----------------|---------|
| Examination of another type | 4,5 | see Annotations | 2 |

| Events | | | | | |
|----------|---------|--|-------|--|------------------------|
| WS 20/21 | 2521302 | Financial Econometrics II | 2 SWS | Lecture (V) /  | Schienle, Buse |
| WS 20/21 | 2521303 | Übung zu Financial Econometrics II | 1 SWS | Practice (Ü) /  | Görgen, Buse, Schienle |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment (Takehome Exam). Details will be announced at the beginning of the course.

Prerequisites

None

Recommendation

Knowledge of the contents covered by the course "Financial Econometrics"

Annotation

Course language is English



The course takes place each second winter term starting in WS2020/21





T

7.80 Course: Financial Intermediation [T-WIWI-102623]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|---------------------|
| WS 20/21 | 2530232 | Financial Intermediation | 2 SWS | Lecture (V) /  | Ruckes |
| WS 20/21 | 2530233 | Übung zu Finanzintermediation | 1 SWS | Practice (Ü) /  | Ruckes, Hoang, Benz |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture covers the following topics:

- 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

Learning outcomes: Students

- are in a position to describe the arguments for the existence of financial intermediaries,
- are able to discuss and analyze both static and dynamic aspects of contractual relationships between banks and borrowers,
- are able to discuss the macroeconomic role of the banking system,
- are in a position to explain the fundamental principles of the prudential regulation of banks and are able to recognize and evaluate the implications of specific regulations.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see the German version.

Literature**Weiterführende Literatur:**

- Hartmann-Wendels/Pfingsten/Weber (2014): Bankbetriebslehre, 6. Auflage, Springer Verlag.
- Freixas/Rochet (2008): Microeconomics of Banking, 2. Auflage, MIT Press.

T

7.81 Course: Financial Management [T-WIWI-102605]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101435 - Essentials of Finance](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|------------------|
| SS 2020 | 2530216 | Financial Management | 2 SWS | Lecture (V) | Ruckes |
| SS 2020 | 2530217 | Übung zu Financial Management | 1 SWS | Practice (Ü) | Ruckes, Schubert |

Competence Certificate

The assessment consists of a written exam (60 min.) according to Section 4 (2), 1 of the examination regulation. The exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Recommendation

Knowledge of the content of the course Business Administration: Finance and Accounting [25026/25027] is recommended.

Below you will find excerpts from events related to this course:

V

Financial Management

2530216, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature**Weiterführende Literatur:**

- Ross, Westerfield, Jaffe, Jordan (2009): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2016): Corporate Finance, 4. Edition, Pearson Addison Wesley

T


7.82 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|----------------------------------|-------|---|-----------------------|
| WS 20/21 | 2114093 | Fluid Technology | 2 SWS | Lecture (V) /  | Geimer, Pult, Metzger |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written 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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

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.
- regular attendance: 21 hours
- self-study: 92 hours

Literature

Skriptum zur Vorlesung *Fluidtechnik*
Institut für Fahrzeugsystemtechnik
downloadbar

**7.83 Course: Foundations of Informatics I [T-WIWI-102749]**

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101417 - Foundations of Informatics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|--|
| SS 2020 | 2511010 | Foundations of Informatics I | 2 SWS | Lecture (V) | Acosta Deibe, Sure-Vetter, Färber |
| SS 2020 | 2511011 | Exercises to Foundations of Informatics I | SWS | Practice (Ü) | Acosta Deibe, Sure-Vetter, Nguyen, Noullet |

Competence Certificate

The assessment consists of an 1h written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

**Foundations of Informatics I**

2511010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The lecture provides an introduction to basic concepts of computer science and software engineering. Essential theoretical foundations and problem-solving approaches, which are relevant in all areas of computer science, are presented and explained, as well as shown in practical implementations.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

Learning objectives:

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

Workload:

- The total workload for this course is approximately 150 hours
- Time of presentness: 45 hours
- Time of preperation and postprocessing: 67.5 hours
- Exam and exam preperation: 37.5 hours

Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

**Exercises to Foundations of Informatics I**2511011, SS 2020, SWS, Language: German, [Open in study portal](#)**Practice (Ü)****Content**

The exercises are related to the lecture Foundations of Informatics I.

Multiple exercises are held that capture the topics, held in the lecture Foundations of Informatics I, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.

The following topics are covered:

- Object Oriented Modeling
- Logic (Propositional Calculus, Predicate Logic, Boolean Algebra)
- Algorithms and Their Properties
- Sort-and Search-Algorithms
- Complexity Theory
- Problem Specification
- Dynamic Data Structures

Learning objectives:

The student

- is able to formalise tasks in the domain of informatics and is able to identify solution methods
- knows the basic terminology of computer science and is capable of applying these terms to different problems.
- knows basic programming structures and is able to apply them (particularly simple data structures, object interaction and implementation of basic algorithms).

Literature

- H. Balzert. Lehrbuch Grundlagen der Informatik. Spektrum Akademischer Verlag 2004.
- U. Schöning. Logik für Informatiker. Spektrum Akademischer Verlag 2000.
- T. H. Cormen, C. E. Leiserson. Introduction to Algorithms, MIT Press 2001.

**7.84 Course: Foundations of Informatics II [T-WIWI-102707]**

Responsible: PD Dr. Steffen Herbold
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101417 - Foundations of Informatics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|-----------------|---------|
| WS 20/21 | 2511012 | Foundations of Informatics II | 3 SWS | Lecture (V) / | Herbold |
| WS 20/21 | 2511013 | Tutorien zu Grundlagen der Informatik II | 1 SWS | Tutorial (Tu) / | Herbold |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (90 min.) according to Section 4(2), 1 of the examination regulation. The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Please note: due to corona, there will be no possibility to improve the grade of the exam in the winter semester 2020/21 by successfully participating in the exercises.

Prerequisites

None

Recommendation

It is recommended to attend the course "Foundations of Informatics I" beforehand.

Active participation in the practical lessons is strongly recommended.

Below you will find excerpts from events related to this course:

**Foundations of Informatics II**

2511012, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
Online**

Content

The lecture deals with formal models for automata, languages and algorithms as well as real instances of these models, i.e. computer architecture and organization (hardware development, computer arithmetic, architecture models), programming languages (different language levels, from microprogramming to higher programming languages, as well as compiling and execution), operating systems and modes (architecture and properties of operating systems, operating system tasks, client-server systems), data organization and management (types of data organization, primary and secondary organization).

Learning objectives:

- Students acquire vast knowledge of methods and concepts in theoretical computer science and computer architectures.
- Based on the acquired knowledge and skills, students are capable of choosing and applying the appropriate methods and concepts for well-defined problem instances.
- Active participation in the tutorials enables students to acquire the necessary knowledge for developing appropriate solutions cooperatively.

Recommendations:

It is recommended to attend the course *Foundations of Informatics I* [2511010] beforehand.

Active participation in the practical lessons is strongly recommended.

Workload:

The total workload for this course is approximately 150 hours.

Organizational issues

Die Vorlesung wird zu Beginn des Semesters 4-stündig und am Ende 2-stündig gelesen, um eine bessere Abdeckung des Inhalts in den Übungen zu gewährleisten.

Literature

Weiterführende Literatur:

Literatur wird in der Vorlesung bekannt gegeben.

T

7.85 Course: Foundations of Interactive Systems [T-WIWI-109816]

Responsible: Prof. Dr. Alexander Mädche
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101434 - eBusiness and Service Management](#)
[M-WIWI-102752 - Fundamentals of Digital Service Systems](#)
[M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)
[M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|--|-------|-------------|---------------|
| SS 2020 | 2540560 | Foundations of Interactive Systems | 3 SWS | Lecture (V) | Mädche, Loewe |

Competence Certificate

Alternative exam assessment. The assessment is carried out in the form of a one-hour written examination and by carrying out a Capstone project.

Details on the assessment will be announced during the lecture.

Prerequisites

None

Recommendation

None

Below you will find excerpts from events related to this course:

V

Foundations of Interactive Systems

2540560, SS 2020, 3 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

Computers have evolved from batch processors towards highly interactive systems. This offers new possibilities but also challenges for the successful design of the interaction between human and computer. Interactive systems are socio-technical systems in which users perform tasks by interacting with technology in a specific context in order to achieve specified goals and outcomes.

This lecture introduces key concepts and principles of interactive systems from a human and computer perspective. Furthermore, it describes core development processes for interactive systems as well as provides insights on the use & contexts of interactive systems with a specific focus on selected application areas in organizations and society. With this lecture, students acquire foundational knowledge to successfully design of the interaction between human and computers in business and private life.

The course is complemented with a design capstone project, where students in a team apply design methods & techniques in order to create an interactive prototype

Learning Objectives

The students

- have a basic understanding of key conceptual and theoretical foundations of interactive systems from a human and computer perspective
- are aware of important design principles for the design of important classes of interactive systems
- know design processes and techniques for developing interactive systems
- know how to apply the knowledge and skills gathered in the lecture for a real-world problem (as part of design-oriented capstone project)

Prerequisites

No specific prerequisites are required for the lecture

Literature

Alan Dix, Janet E. Finlay, Gregory D. Abowd, and Russell Beale. 2003. Human-Computer Interaction (3rd Edition). Prentice-Hall, Inc., USA.

Further literature will be made available in the lecture.

T

7.86 Course: Foundations of Mobile Business [T-WIWI-104679]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 4 |

Competence Certificate

The assessment of this course is a written (60 min.) or (if necessary) oral examination according to §4(2) of the examination regulation.

Prerequisites

None

Annotation

Lecture and exercises are integrated.

T


7.87 Course: Fuels and Lubricants for Combustion Engines [T-MACH-105184]




Responsible: Hon.-Prof. Dr. Bernhard Ulrich Kehrwald
Dr.-Ing. Heiko Kubach

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|----------|
| WS 20/21 | 2133109 | Fuels and Lubricants for Combustion Engines | 2 SWS | Lecture (V) /  | Kehrwald |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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

2133109, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

Introduction and basics

Fuels for Gasoline and Diesel engines

Hydrogen

Lubricants for Gasoline and Diesel engines

Coolants for combustion engines

Literature

Skript

T


7.88 Course: Functional Ceramics [T-MACH-105179]


Responsible: Dr. Manuel Hinterstein
Dr.-Ing. Wolfgang Rheinheimer

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|-------------------------------------|-------|---|-------------|
| WS 20/21 | 2126784 | Functional Ceramics | 2 SWS | Lecture (V) /  | Hinterstein |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of an oral exam (20 min) taking place at the agreed date.

Auxiliary means: none

The re-examination is offered upon agreement.

Prerequisites

none


T

7.89 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 1,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|----------|
| WS 20/21 | 2113814 | Fundamentals for Design of Motor-Vehicles Bodies I | 1 SWS | Lecture (V) /  | Bardehle |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Learning Objectives:

The students have an overview of the fundamental possibilities for design and manufacture of motor-vehicle bodies. They know the complete process, from the first idea, through the concept to the dimensioned drawings (e.g. with FE-methods). They have knowledge about the fundamentals and their correlations, to be able to analyze and to judge relating components as well as to develop them accordingly.

Organizational issues

Termine, nähere Informationen und eventuelle Terminänderungen: siehe Institutshomepage

Dates and further information will be published on the homepage of the institute

Literature

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

T

7.90 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 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 1,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|----------|
| SS 2020 | 2114840 | Fundamentals for Design of Motor-Vehicles Bodies II | 1 SWS | Lecture (V) | Bardehle |

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 2020, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students know that, often the design of seemingly simple detail components can result in the solution of complex problems. They have knowledge in testing procedures of body properties. They have an overview of body parts such as bumpers, window lift mechanism and seats. They understand, as well as, parallel to the normal electrical system, about the electronic side of a motor vehicle. Based on this they are ready to analyze and to judge the relation of these single components. They are also able to contribute competently to complex development tasks by imparted knowledge in project management.

Organizational issues

Voraussichtliche Termine, nähere Informationen und evtl. Änderungen:

siehe Institutshomepage.

Scheduled dates, further Information and possible changes of date:

see homepage of the institute.

Literature

1. Automobiltechnische Zeitschrift ATZ, Friedr. Vieweg & Sohn Verlagsges. mbH, Wiesbaden
2. Automobil Revue, Bern (Schweiz)
3. Automobil Produktion, Verlag Moderne Industrie, Landsberg

T

7.91 Course: Fundamentals in the Development of Commercial Vehicles I [T-MACH-105160]





Responsible: Dr. Christof Weber

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 1,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-------|
| WS 20/21 | 2113812 | Fundamentals in the Development of Commercial Vehicles I | 1 SWS | Lecture (V) /  | Weber |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Learning Objectives:

The students have proper knowledge about the process of commercial vehicle development starting from the concept and the underlying original idea to the real design. They are able to plan, to steer, and to handle this process. They know that the customer requirements, the technical realisability, the functionality and the economy are important drivers.

The students are able to develop parts and components. Furthermore they have knowledge about different cab concepts, the interior and the interior design process. Consequently they are ready to analyze and to judge concepts of commercial vehicles as well as to participate competently in the commercial vehicle development.

Organizational issues

Termine und Nähere Informationen: siehe Institutshomepage

Dates and further information will be published on the homepage of the institute.

Literature

1. SPECKERT, M.; RUF, N.; DRESSLER, K.; MÜLLER, R.; WEBER, C.; WEIHE, S.: Ein neuer Ansatz zur Ermittlung von Erprobungslasten für sicherheitsrelevante Bauteile; Kaiserslautern: Fraunhofer ITWM, 2009, 27 pp.; Berichte des Fraunhofer ITWM, 177; ISSN: 1434-9973
2. SPECKERT, M.; DRESSLER, K.; RUF, N.; MÜLLER, R.; WEBER, C.: Customer Usage Profiles, Strength Requirements and Test Schedules in Truck Engineering, in: Schindler, C. et al. (Eds.): Proceedings of the 1st Commercial Vehicle Technology Symposium (CVT 2010), Shaker Verlag, 2010, S. 298-307
3. TEUTSCH, R. RITTER, J.; WEBER, C.; KOLB, G.; VILCENS, B.; LOPATTA, A.: Einsatz eines Fahrerleitsystems zur Qualitätssteigerung bei der Betriebsfestigkeitserprobung, Proceedings, 1st Commercial Vehicle Technology Symposium Kaiserslautern, 16. – 18. März 2010
4. WEBER, C.; MÜLLER, R.; TEUTSCH, R.; DRESSLER, K.; SPECKERT, M.: A New Way to Customer Loads Correlation and Testing in Truck Engineering of Daimler Trucks, Proceedings of the 1st International Munich Chassis Symposium, chassis.tech, Munich, Germany, 8th - 9th Juni 2010
5. TEUTSCH, R.; WEBER, C.; MÜLLER, R.; SCHON, U.; EPPLER, R.: Einsatzspezifische Erprobung als Baustein zur Verringerung des Fahrzeuggewichts von Lastkraftwagen, DVM-Berichtsband 138, S. 189 – 201, 2011

T

7.92 Course: Fundamentals in the Development of Commercial Vehicles II [T-MACH-105161]

Responsible: Dr. Christof Weber

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 1,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|------|
| SS 2020 | 2114844 | Fundamentals in the Development of Commercial Vehicles II | 1 SWS | Lecture (V) | 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 2020, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students know the advantages and disadvantages of different drives. Furthermore they are familiar with components, such as transfer box, propeller shaft, powered and non-powered frontaxle etc. Beside other mechanical components, such as chassis, axle suspension and braking system, also electric and electronic systems are known. Consequently the student are able to analyze and to judge the general concepts as well as to adjust them precisely with the area of application.

Organizational issues

genaue Termine, nähere Informationen und eventuelle Terminänderungen:
siehe Institutshomepage.

Literature

- 1.HILGERS, M.: Nutzfahrzeugtechnik lernen, Springer Vieweg, ISSN: 2510-1803
- 2.SCHITTLER, M.; HEINRICH, R.; KERSCHBAUM, W.: Mercedes-Benz Baureihe 500 – neue V-Motorengeneration für schwere Nutzfahrzeuge, MTZ 57 Nr. 9, S. 460 ff, 1996
- 3.Robert Bosch GmbH (Hrsg.): Bremsanlagen für Kraftfahrzeuge, VDI-Verlag, Düsseldorf, 1. Auflage, 1994
- 4.RUBI, V.; STRIFLER, P. (Hrsg. Institut für Kraftfahrwesen RWTH Aachen): Industrielle Nutzfahrzeugentwicklung, Schriftenreihe Automobiltechnik, 1993
- 5.TEUTSCH, R.; CHERUTI, R.; GASSER, R.; PEREIRA, M.; de SOUZA, A.; WEBER, C.: Fuel Efficiency Optimization of Market Specific Truck Applications, Proceedings of the 5th Commercial Vehicle Technology Symposium – CVT 2018



T





7.93 Course: Fundamentals of Automobile Development I [T-MACH-105162]

Responsible: Hon.-Prof. Rolf Frech
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 1,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|-------|
| WS 20/21 | 2113810 | Fundamentals of Automobile Development I | 1 SWS | Lecture (V) /  | Frech |
| WS 20/21 | 2113851 | Principles of Whole Vehicle Engineering I | 1 SWS | Lecture (V) /  | Frech |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Learning Objectives:

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

Organizational issues

Termine und nähere Informationen finden Sie auf der Institutshomepage.

Kann nicht mit Lehrveranstaltung 2113851 kombiniert werden.

Date and further information will be published on the homepage of the institute.

Cannot be combined with lecture 2113851.

Literature

Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

**Principles of Whole Vehicle Engineering I**2113851, WS 20/21, 1 SWS, Language: English, [Open in study portal](#)**Lecture (V)
Online****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

Learning Objectives:

The students have an overview of the fundamentals of the development of automobiles. They know the development process, the national and the international legal requirements that are to be met. They have knowledge about the thermo-management, aerodynamics and the design of an automobile. They are ready to judge goal conflicts in the field of automobile development and to work out approaches to solving a problem.

Organizational issues

Termine und nähere Informationen finden Sie auf der Institutshomepage.

Dats and further information will be published on the homepage of the institute.

Kann nicht mit Lehrveranstaltung 2113810 kombiniert werden

Cannot be combined with lecture 2113810.

Literature

Skript zur Vorlesung wird zu Beginn des Semesters ausgegeben

The scriptum will be provided during the first lessons

**7.94 Course: Fundamentals of Automobile Development II [T-MACH-105163]**

Responsible: Hon.-Prof. Rolf Frech
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 1,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|--|-------|-------------|-------|
| SS 2020 | 2114842 | Fundamentals of Automobile Development II | 1 SWS | Lecture (V) | Frech |
| SS 2020 | 2114860 | Principles of Whole Vehicle Engineering II | 1 SWS | | Frech |

Competence Certificate

Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites

none

Below you will find excerpts from events related to this course:

**Fundamentals of Automobile Development II**2114842, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

Organizational issues

Vorlesung findet als Blockvorlesung statt,

Geb. 70.04 (Campus Ost), Raum 219, Termine werden auf der Institutshomepage bekanntgegeben

Kann nicht mit der Veranstaltung [2114860] kombiniert werden.

Cannot be combined with lecture [2114860].

Literature

Skript zur Vorlesung ist über ILIAS verfügbar.



Principles of Whole Vehicle Engineering II

2114860, SS 2020, 1 SWS, Language: English, [Open in study portal](#)

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

Learning Objectives:

The students are familiar with the selection of appropriate materials and the choice of adequate production technology. They have knowledge of the acoustical properties of the automobiles, covering both the interior sound and exterior noise. They have an overview of the testing procedures of the automobiles. They know in detail the evaluation of the properties of the complete automobile. They are ready to participate competently in the development process of the complete vehicle.

Organizational issues

Kann nicht mit der Veranstaltung [2114842] kombiniert werden.

Cannot be combined with lecture [2114842].

Raum 219, Geb. 70.04, Campus Ost.

Genauere Termine entnehmen Sie bitte der Institushomepage.

Scheduled dates:

see homepage of the institute.

Literature

Das Skript zur Vorlesung ist über ILIAS verfügbar.

T


7.95 Course: Fundamentals of Catalytic Exhaust Gas Aftertreatment [T-MACH-105044]





Responsible: Prof. Dr. Olaf Deutschmann
 Prof. Dr. Jan-Dierk Grunwaldt
 Dr.-Ing. Heiko Kubach
 Hon.-Prof. Dr. Egbert Lox

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-----------------------------|
| SS 2020 | 2134138 | Fundamentals of catalytic exhaust gas aftertreatment | 2 SWS | Lecture (V) | Lox, Grunwaldt, Deutschmann |
| WS 20/21 | 2134138 | Fundamentals of catalytic exhaust gas aftertreatment | 2 SWS | Lecture (V) /  | Lox, Grunwaldt, Deutschmann |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

oral examination, Duration: 25 min., no auxiliary means

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Fundamentals of catalytic exhaust gas aftertreatment

2134138, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Organizational issues

Blockvorlesung, Termin und Ort werden auf der Homepage des IFKM und ITCP bekannt gegeben.

Literature

Skript, erhältlich in der Vorlesung

- "Environmental Catalysis" Edited by G.Ertl, H. Knötzinger, J. Weitkamp Wiley-VCH Verlag GmbH, Weinheim, 1999 ISBN 3-527-29827-4
- "Cleaner Cars- the history and technology of emission control since the 1960s" J. R. Mondt Society of Automotive Engineers, Inc., USA, 2000 Publication R-226, ISBN 0-7680-0222-2
- "Catalytic Air Pollution Control - commercial technology" R. M. Heck, R. J. Farrauto John Wiley & Sons, Inc., USA, 1995 ISBN 0-471-28614-1
- "Automobiles and Pollution" P. Degobert Editions Technic, Paris, 1995 ISBN 2-7108-0676-2
- "Reduced Emissions and Fuel Consumption in Automobile Engines" F. Schaeder, R. van Basshuysen, Springer Verlag Wien New York, 1995 ISBN 3-211-82718-8
- "Autoabgaskatalysatoren: Grundlagen - Herstellung - Entwicklung - Recycling - Ökologie" Ch. Hagelüken und 11 Mitautoren, Expert Verlag, Renningen, 2001 ISBN 3-8169-1932-4

V

Fundamentals of catalytic exhaust gas aftertreatment

2134138, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Organizational issues

Blockvorlesung, Termin und Ort werden auf der Homepage des IFKM und ITCP bekannt gegeben.

Literature

Skript, erhältlich in der Vorlesung

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 : Grundlagen - Herstellung - Entwicklung - Recycling - Ökologie" Ch. Hagelüken und 11 Mitautoren, Expert Verlag, Renningen, 2001 ISBN 3-8169-1932-4

T

7.96 Course: Fundamentals of Production Management [T-WIWI-102606]

Responsible: Prof. Dr. Frank Schultmann
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101437 - Industrial Production I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|-------------------|
| SS 2020 | 2581950 | Fundamentals of Production Management | 2 SWS | Lecture (V) | Schultmann |
| SS 2020 | 2581951 | Übungen Grundlagen der Produktionswirtschaft | 2 SWS | Practice (Ü) | Stallkamp, Steins |

Competence Certificate

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Fundamentals of Production Management

2581950, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

This lecture focuses on strategic production management with respect to various economic aspects. Interdisciplinary approaches of systems theory will be used to describe the challenges of industrial production. This course will emphasize the importance of R&D as the central step in strategic corporate planning to ensure future long-term success. In the field of site selection and planning for firms and factories, attention will be drawn upon individual aspects of existing and greenfield sites as well as existing distribution and supply centres. Students will obtain knowledge in solving internal and external transport and storage problems.

Organizational issues

Blockveranstaltung, siehe Institutsaushang

Literature

Wird in der Veranstaltung bekannt gegeben.


T

7.97 Course: Gear Cutting Technology [T-MACH-102148]

Responsible: Dr.-Ing. Markus Klaiber
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101265 - Vehicle Development](#)
[M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---------------------------------|-------|---|---------|
| WS 20/21 | 2149655 | Gear Technology | 2 SWS | Lecture (V) /  | Klaiber |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Oral Exam (20 min)

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Gear Technology

2149655, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

The objective of the lecture is the introduction into modern gear technology. In this respect, the basics of gear and transmission technology are reviewed in detail. The load of gears and process chains are derived through the requirements of modern drive systems. For comprehensive understanding of gear manufacturing different processes, machine technologies, tools and applications are introduced with the help of a wide range of sample components. Furthermore, current research projects are presented. Demonstrations in the production laboratory of the institute and an excursion to an industrial gear manufacturing company round off the lecture.

The following topics will be covered:

- Sample applications and the need for gearboxes
- Basics of gear and transmission technology
- Loads of gears and process chains
- Manufacturing techniques
- Heat Treatment
- Quality assurance
- Simulation techniques

Learning Outcomes:

The students ...

- know the basic terms of gearings and are able to explain the imparted basics of gear and transmission technology.
- are able to specify the different manufacturing processes and machine technologies for gear manufacturing. Furthermore, they are able to explain the functional principles and the dis-/advantages of these manufacturing processes.
- are able to read and interpret measuring records for gearings.
- are able to make an appropriate selection of a process chain for a given application. Hereby, they can determine the main impact factors of the different process steps.

Workload:

regular attendance: 21 hours
 self-study: 99 hours

Literature

Medien:

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).





T

7.98 Course: Geological Hazards and Risk [T-PHYS-103525]

Responsible: Dr. Ellen Gottschämmer**Organisation:** KIT Department of Physics**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 8 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|--|-----------------------|
| WS 20/21 | 4060121 | Geological Hazards and Risk | 2 SWS | Lecture (V) /  | Gottschämmer, Daniell |
| WS 20/21 | 4060122 | Exercises on Geological Hazards and Risk | 2 SWS | Practice (Ü) /  | Gottschämmer, Daniell |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.99 Course: Global Optimization I [T-WIWI-102726]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101413 - Applications of Operations Research](#)
[M-WIWI-101414 - Methodical Foundations of OR](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

Competence Certificate

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

Success is in the form of a written examination (60 min.) (according to § 4(2), 1 SPO).

The exam is offered in the lecture of semester and the following semester.

The success check can be done also with the success control for "Global optimization II". In this case, the duration of the written exam is 120 min.

Prerequisites

None

Recommendation

None

Annotation

Part I and II of the lecture are held consecutively in the **same** semester.

T

7.100 Course: Global Optimization I and II [T-WIWI-103638]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each summer term | 1 |

Competence Certificate

Please note: due to the research semester of Prof. Dr. Stein the lectures will not be offered in summer semester 2020.
 The assessment of the lecture is a written examination (120 minutes) according to §4(2), 1 of the examination regulation.
 The examination is held in the semester of the lecture and in the following semester.

Prerequisites

None

Recommendation

None

Annotation

Part I and II of the lecture are held consecutively in the **same** semester.

T

7.101 Course: Global Optimization II [T-WIWI-102727]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 2 |

Competence Certificate

Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

The examination is held in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of "Global optimization I". In this case, the duration of the written examination takes 120 minutes.

Prerequisites

None


Annotation

Part I and II of the lecture are held consecutively in the **same** semester.

T

7.102 Course: Global Production [T-MACH-110991]**Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|-----------------------------------|-------|---|-------|
| WS 20/21 | 2149613 | Global Production | 2 SWS | Lecture (V) /  | Lanza |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Written Exam (60 min)

Recommendation

Participation in "T-MACH-110981 - Tutorial Global Production" is recommended, but not mandatory.

Below you will find excerpts from events related to this course:

V

Global Production2149613, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)
Online**

Content

The lecture examines the management of global production networks of manufacturing companies. It gives an overview of the influencing factors and challenges of global production. In-depth knowledge of common methods and procedures for planning, designing and managing global production networks is imparted.

Therefore, the lecture first of all discusses the connections and interdependencies between the business strategy and the production strategy and illustrates necessary tasks for the definition of a production strategy. Methods for site selection, for the site-specific adaptation of product design and production technology as well as for the establishment of new production sites and for the adaptation of existing production networks to changing framework conditions are subsequently taught within the context of the design of the network footprint. With regard to the management of global production networks, the lecture addresses challenges associated with coordination, procurement and order management in global networks. The lecture is complemented by a discussion on the use of industry 4.0 applications in global production and current trends in planning, designing and managing global production networks.

The topics include:

- Basic conditions and influencing factors of global production (historical development, targets, chances and threats)
- Framework for planning, designing and managing global production networks
- Production strategies for global production networks
 - From business strategy to production strategy
 - Tasks of the production strategy (product portfolio management, circular economy, planning of production depth, production-related research and development)
- Design of global production networks
 - Basic types of network structures
 - Planning process for the design of the network footprint
 - Adaptation of the network footprint
 - Site selection
 - Location-specific adaptation of production technology and product design
- Management of global production networks
 - Network coordination
 - Procurement process
 - Order management
- Trends in planning, designing and managing global production networks

Learning Outcomes:

The students ...

- can explain the general conditions and influencing factors of global production
- are capable to apply defined procedures for site selection and to evaluate site decisions with the help of different methods
- are able to select the adequate scope of design for site appropriate production and product construction cases specifically
- can state the central elements in the planning process of establishing a new production site.
- are capable to make use of the methods to design and scale global production networks for company-individual problems
- are able to show up the challenges and potentials of the departments sales, procurement as well as research and development on global basis.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Recommendations:

Combination with Global Production and Logistics – Part 2

Organizational issues

Vorlesungstermine montags 14:00 - 15:30 Uhr

Lectures on Mondays 14:00 - 15:30

Literature**Medien**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt

empfohlene Sekundärliteratur:

Abele, E. et al: Handbuch Globale Produktion, Hanser Fachbuchverlag, 2006 (deutsch)

Media

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

recommended secondary literature:

Abele, E. et al: Global Production – A Handbook for Strategy and Implementation, Springer 2008 (english)

T


7.103 Course: Großdiesel- und -gasmotoren für Schiffsantriebe [T-MACH-110816]


Responsible: Dr.-Ing. Heiko Kubach

Organisation:

Part of: M-MACH-101303 - Combustion Engines II

| Type | Credits | Recurrence | Expansion | Version |
|------------------|---------|------------------|-----------|---------|
| Oral examination | 4 | Each summer term | 1 terms | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|--------|
| SS 2020 | 2134154 | Large Diesel and Gas Engines for Ship Propulsions | 2 SWS | Lecture (V) | Kubach |
| WS 20/21 | 2134154 | Large Diesel and Gas Engines for Ship Propulsions | 2 SWS | Lecture (V) /  | Kubach |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

oral exam, 20 minutes

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Large Diesel and Gas Engines for Ship Propulsions2134154, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

- Introduction and History
- Types of Ships and Propulsion Systems
- Thermodynamic
- Boosting
- Design
- Fuels
- Lubricants
- Injection of liquid Fuels
- Combustion Processes for liquid Fuels
- Injection of Gaseous Fuels
- Combustion Processes for Gaseous Fuels
- Emissions
- Integration of Engines in Ships
- Large Engines in other Applications

V

Large Diesel and Gas Engines for Ship Propulsions2134154, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)Lecture (V)
On-Site

Content

- Introduction and History
- Types of Ships and Propulsion Systems
- Thermodynamic
- Boosting
- Design
- Fuels
- Lubricants
- Injection of liquid Fuels
- Combustion Processes for liquid Fuels
- Injection of Gaseous Fuels
- Combustion Processes for Gaseous Fuels
- Emissions
- Integration of Engines in Ships
- Large Engines in other Applications


T



7.104 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 - Handling Characteristics of Motor Vehicles](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-------|
| WS 20/21 | 2113807 | Handling Characteristics of Motor Vehicles I | 2 SWS | Lecture (V) /  | Unrau |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Learning Objectives:

The students know the basic connections between drivers, vehicles and environment. They can build up a vehicle simulation model, with which forces of inertia, aerodynamic forces and tyre forces as well as the appropriate moments are considered. They have proper knowledge in the area of tyre characteristics, since a special meaning comes to the tire behavior during driving dynamics simulation. Consequently they are ready to analyze the most important influencing factors on the driving behaviour and to contribute to the optimization of the handling characteristics.

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.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen I

T

7.105 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 - Handling Characteristics of Motor Vehicles](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-------|
| SS 2020 | 2114838 | Handling Characteristics of Motor Vehicles II | 2 SWS | Lecture (V) | 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 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students have an overview of common test methods, with which the handling of vehicles is gauged. They are able to interpret results of different stationary and transient testing methods. Apart from the methods, with which e.g. the driveability in curves or the transient behaviour from vehicles can be registered, also the influences from cross-wind and from uneven roadways on the handling characteristics are well known. They are familiar with the stability behavior from single vehicles and from vehicles with trailer. Consequently they are ready to judge the driving behaviour of vehicles and to change it by specific vehicle modifications.

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.: Umdrucksammlung zur Vorlesung Fahreigenschaften von Kraftfahrzeugen II

T

7.106 Course: High Performance Powder Metallurgy Materials [T-MACH-102157]

Responsible: Dr. Günter Schell**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|--------|
| SS 2020 | 2126749 | Advanced powder metals | 2 SWS | Lecture (V) | Schell |

Competence Certificate

oral exam, 20- 30 min

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Advanced powder metals2126749, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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. Thümmel, R. Oberacker. "Introduction to Powder Metallurgy", Institute of Materials, 1993



T

7.107 Course: Human Resource Management [T-WIWI-102909]

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101513 - Human Resources and Organizations](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|---------------------|
| WS 20/21 | 2573005 | Human Resource Management | 2 SWS | Lecture (V) /  | Nieken |
| WS 20/21 | 2573006 | Übung zu Human Resource Management | 1 SWS | Practice (Ü) /  | Nieken, Mitarbeiter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment of this course is a written examination of 1 hour. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Prerequisites

None

Recommendation

Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory, and statistics is recommended.

Below you will find excerpts from events related to this course:

V

Human Resource Management

2573005, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The students acquire basic knowledge in the fields of human resource planning, selection and talent management. Different processes and instruments and their link to corporate strategy are evaluated based on microeconomic and behavioral approaches. The results are tested and discussed based on empirical data.

Aim

The student

- understands the processes and instruments of human resource management.
- analyzes different methods of human resource planning and selection and evaluates their usefulness.
- analyzes different processes of talent management and evaluates the strengths and weaknesses.
- understands the challenges of human resource management and its link to corporate strategy.

Workload

The total workload for this course is approximately 135 hours.

Lecture: 32 hours

Preparation of lecture: 52 hours

Exam preparation: 51 hours

Literature

- Personnel Economics in Practice, Lazear & Gibbs, John Wiley & Sons, 2014
- Strategic Human Resources. Frameworks for General Managers, Baron & Kreps, John Wiley & Sons, 1999





T

7.108 Course: Hydraulic Engineering and Water Management [T-BGU-101667]

Responsible: Prof. Dr. Franz Nestmann
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|----------|
| WS 20/21 | 6200511 | Wasserbau und Wasserwirtschaft | 2 SWS | Lecture (V) /  | Nestmann |
| WS 20/21 | 6200512 | Übungen zu Wasserbau und Wasserwirtschaft | 1 SWS | Practice (Ü) /  | Seidel |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam with 60 minutes

Prerequisites

None

Recommendation

None

Annotation



None




T

7.109 Course: Hydrology [T-BGU-101693]

Responsible: Prof. Dr.-Ing. Erwin Zehe
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|---------------------------------------|-------|--|-----------------|
| WS 20/21 | 6200513 | Hydrologie | 2 SWS | Lecture (V) /  | Zehe, Wienhöfer |
| WS 20/21 | 6200514 | Übungen zu Hydrologie | 1 SWS | Practice (Ü) /  | Zehe, Wienhöfer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Prerequisites

None

Recommendation

None

Annotation

None

T


7.110 Course: I4.0 Systems Platform [T-MACH-106457]

Responsible: Dipl.-Ing. Thomas Maier
Prof. Dr.-Ing. Jivka Ovtcharova

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4 | Each term | 2 |

| Events | | | | | |
|----------|---------|---------------------------------------|-------|---|-------------------|
| SS 2020 | 2123900 | I4.0 Systems platform | 4 SWS | Project (PRO) | Ovtcharova, Maier |
| WS 20/21 | 2123900 | I4.0 Systems platform | 4 SWS | Project (PRO) /  | Ovtcharova, Maier |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment (project work)

Prerequisites

None

Annotation

Limited number of participants.

Below you will find excerpts from events related to this course:

V

I4.0 Systems platform

2123900, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Project (PRO)

Content

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

Organizational issues

Siehe Homepage zur Lehrveranstaltung

Literature

Keine / None

V

I4.0 Systems platform

2123900, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

Project (PRO)
Blended (On-Site/Online)

Content

Industry 4.0, IT systems for fabrication (e.g.: CAx, PDM, CAM, ERP, MES), process modelling and execution, project work in teams, practice-relevant I4.0 problems, in automation, manufacturing industry and service.

Students can

- describe the fundamental concepts, challenges, and objectives of Industrie 4.0 and name the essential terms in context of information management
- explain the necessary information flow between the different IT systems. They get practically knowledge about using current IT systems in context of I4.0, from order to production.
- map and analyze processes in the context of Industry 4.0 with special methods of process modelling
- collaboratively grasp practical I4.0 issues using existing hardware and software and work out solutions for a continuous improvement process in a team
- prototypically implement the self-developed solution proposal with the given IT systems and the existing hardware equipment and finally present the results

Organizational issues

Veranstaltungsort: CAIT am IMI in der Kriegsstraße 77. Zeit siehe ILIAS zur Lehrveranstaltung.

Literature


Keine / None

T

7.111 Course: Ignition Systems [T-MACH-105985]

Responsible: Dr.-Ing. Olaf Toedter
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101303 - Combustion Engines II](#)

| Type | Credits | Version |
|------------------|---------|---------|
| Oral examination | 4 | 1 |

| Events | | | | | |
|----------|---------|----------------------------------|-------|---|---------|
| WS 20/21 | 2133125 | Ignition systems | 2 SWS | Lecture (V) /  | Toedter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate
oral exam, 20 min

Prerequisites
none

Below you will find excerpts from events related to this course:

V

Ignition systems

2133125, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

- Ignition Process
- Spark Ignition
- Principle of Spark Ignition Systems
- Limits of Spark Ignition
- New Developments of Spark Ignition Systems
- New an Alternative Ignition Systems

T

7.112 Course: Industrial Organization [T-WIWI-102844]

Responsible: Prof. Dr. Johannes Philipp Reiß
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101499 - Applied Microeconomics](#)
[M-WIWI-101501 - Economic Theory](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Irregular | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|--------------|
| SS 2020 | 2560238 | Industrial Organization | 2 SWS | Lecture (V) | Reiß, Peters |
| SS 2020 | 2560239 | Übung zu Industrieökonomie | 2 SWS | Practice (Ü) | Peters, Reiß |

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Recommendation

Completion of the module Economics [WW1VWL] is assumed.

Annotation

This course is not given in summer 2017.

Below you will find excerpts from events related to this course:

V

Industrial Organization

2560238, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature**Verpflichtende Literatur:**

H. Bester (2012): Theorie der Industrieökonomik, Springer-Verlag.

Ergänzende Literatur:

J. Tirole (1988): Theory of Industrial Organization, MIT Press.

D. Carlton / J. Perloff (2005): Modern Industrial Organization, Pearson.

P. Belleflamme / M. Peitz (2010): Industrial Organization

T

7.113 Course: Information Engineering [T-MACH-102209]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 2 |

| Events | | | | | |
|---------|---------|---|-------|-------------|----------------------------|
| SS 2020 | 2122014 | Information Engineering | 2 SWS | Seminar (S) | Ovtcharova, Mitarbeiter |

Competence Certificate

Alternative exam assessment (written composition and speech)

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Information Engineering2122014, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)****Content**

Seminar papers on current research topics of the Institute for Information Management in Engineering. The respective topics are presented at the beginning of each semester.

Organizational issues

Siehe Homepage zur Lehrveranstaltung


Literature





Themenspezifische Literatur

T

7.114 Course: Integrated Information Systems for Engineers [T-MACH-102083]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 2 |

| Events | | | | | |
|----------|---------|--|-------|---|------------------------|
| SS 2020 | 2121001 | Integrated Information Systems for engineers | 3 SWS | Lecture / Practice (VÜ) | Ovtcharova, Elstermann |
| WS 20/21 | 2121001 | Integrated Information Systems for engineers | 3 SWS | Lecture / Practice (VÜ) /  | Ovtcharova, Elstermann |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Oral examination 20 min.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Integrated Information Systems for engineers2121001, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

Content

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

Students can:

- illustrate the structure and operating mode of information systems
- describe the structure of relational databases
- describe the fundamentals of knowledge management and its application in engineering and deploy ontology as knowledge representation
- describe different types of process modelling and their application and illustrate and execute simple work flows and processes with selected tools
- explain different goals of specific IT systems in product development (CAD, CAP, CAM, PPS, ERP, PDM) and assign product development processes

Literature

Vorlesungsfolien / lecture slides

V

Integrated Information Systems for engineers2121001, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)
Online

Content

- Information systems, information management
- CAD, CAP and CAM systems
- PPS, ERP and PDM systems
- Knowledge management and ontology
- Process modeling

Students can:

- illustrate the structure and operating mode of information systems
- describe the structure of relational databases
- describe the fundamentals of knowledge management and its application in engineering and deploy ontology as knowledge representation
- describe different types of process modelling and their application and illustrate and execute simple work flows and processes with selected tools
- explain different goals of specific IT systems in product development (CAD, CAP, CAM, PPS, ERP, PDM) and assign product development processes

Literature

Vorlesungsfolien / lecture slides

T

7.115 Course: Integrated Production Planning in the Age of Industry 4.0 [T-MACH-109054]

Responsible: Prof. Dr.-Ing. Gisela Lanza

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101272 - Integrated Production Planning](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------------------|-------|
| SS 2020 | 2150660 | Integrated Production Planning in the Age of Industry 4.0 | 6 SWS | Lecture / Practice (VÜ) | Lanza |

Competence Certificate

Written Exam (120 min)

Prerequisites

"T-MACH-108849 - Integrierte Produktionsplanung im Zeitalter von Industrie 4.0" as well as "T-MACH-102106 Integrierte Produktionsplanung" must not be commenced.

Below you will find excerpts from events related to this course:

V

Integrated Production Planning in the Age of Industry 4.0

2150660, SS 2020, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)

Content

Integrated production planning in the age of industry 4.0 will be taught in the context of this engineering science lecture. In addition to a comprehensive introduction to Industry 4.0, the following topics will be addressed at the beginning of the lecture:

- Basics, history and temporal development of production
- Integrated production planning and integrated digital engineering
- Principles of integrated production systems and further development with Industry 4.0

Building on this, the phases of integrated production planning are taught in accordance with VDI Guideline 5200, whereby special features of parts production and assembly are dealt with in the context of case studies:

- Factory planning system
- Definition of objectives
- Data collection and analysis
- Concept planning (structural development, structural dimensioning and rough layout)
- Detailed planning (production planning and control, fine layout, IT systems in an industry 4.0 factory)
- Preparation and monitoring of implementation
- Start-up and series support

The lecture contents are rounded off by numerous current practical examples with a strong industry 4.0 reference. Within the exercises the lecture contents are deepened and applied to specific problems and tasks.

Learning Outcomes:

The students ...

- can discuss basic questions of production technology.
- are able to apply the methods of integrated production planning they have learned about to new problems.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about for a specific problem.
- can apply the learned methods of integrated production planning to new problems.
- can use their knowledge targeted for efficient production technology.

Workload:**MACH:**

regular attendance: 63 hours

self-study: 177 hours

WING:

regular attendance: 63 hours

self-study: 207 hours

Organizational issues

Start: 21.04.2020

Vorlesungstermine dienstags 14.00 Uhr und donnerstags 14.00 Uhr, Übungstermine donnerstags 15.45 Uhr. Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung

Literature**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T


7.116 Course: Integrative Strategies in Production and Development of High Performance Cars [T-MACH-105188]





Responsible: Dr. Karl-Hubert Schlichtenmayer

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|-----------------|
| SS 2020 | 2150601 | Integrative Strategies in Production and Development of High Performance Cars | 2 SWS | Lecture (V) | Schlichtenmayer |
| WS 20/21 | 2150601 | Integrative Strategies in Production and Development of High Performance Cars | 2 SWS | Lecture (V) /  | Schlichtenmayer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written Exam (60 min)

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Integrative Strategies in Production and Development of High Performance Cars

2150601, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples.

The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

Learning Outcomes:

The students ...

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Start: 21.04.2020

Literature**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

**Integrative Strategies in Production and Development of High Performance Cars**

2150601, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture deals with the technical and organizational aspects of integrated development and production of sports cars on the example of Porsche AG. The lecture begins with an introduction and discussion of social trends. The deepening of standardized development processes in the automotive practice and current development strategies follow. The management of complex development projects is a first focus of the lecture. The complex interlinkage between development, production and purchasing are a second focus. Methods of analysis of technological core competencies complement the lecture. The course is strongly oriented towards the practice and is provided with many current examples.

The main topics are:

- Introduction to social trends towards high performance cars
- Automotive Production Processes
- Integrative R&D strategies and holistic capacity management
- Management of complex projects
- Interlinkage between R&D, production and purchasing
- The modern role of manufacturing from a R&D perspective
- Global R&D and production
- Methods to identify core competencies

Learning Outcomes:

The students ...

- are capable to specify the current technological and social challenges in automotive industry.
- are qualified to identify interlinkages between development processes and production systems.
- are able to explain challenges and solutions of global markets and global production of premium products.
- are able to explain modern methods to identify key competences of producing companies.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Die LV wurde wegen der Coronapandemie vom SS 20 ins WS 20/21 verschoben.

Literature**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:


Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).





T

7.117 Course: International Finance [T-WIWI-102646]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101402 - eFinance](#)
[M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|-----------------|---------|
| Written examination | 3 | see Annotations | 1 |

| Events | | | | | |
|----------|---------|---------------------------------------|-------|---|-----------------------|
| SS 2020 | 2530570 | International Finance | 2 SWS | Lecture (V) | Walter, Uhrig-Homburg |
| WS 20/21 | 2530570 | International Finance | 2 SWS | Lecture (V) /  | Walter, Uhrig-Homburg |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

See German version.

Prerequisites

None

Recommendation

None

Annotation

The course will not be offered in the summer semester 2020 as originally planned, but only in the winter semester 2020/2021. The course is offered as a 14-day or block course.

Below you will find excerpts from events related to this course:

V

International Finance

2530570, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Organizational issues

Diese Veranstaltung findet im WS 20/21 statt.

Literature**Weiterführende Literatur:**

- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.

V

International Finance

2530570, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site**Organizational issues**

Blockveranstaltung

Literature

Weiterführende Literatur:


- Eiteman, D. et al., Multinational Business Finance, 13. Auflage, 2012.
- Solnik, B. und D. McLeavey, Global Investments, 6. Auflage, 2008.





T

7.118 Course: International Marketing [T-WIWI-102807]

Responsible: Dr. Sven Feurer
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101424 - Foundations of Marketing](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 1,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|--------|
| WS 20/21 | 2572155 | International Marketing | 1 SWS | Lecture (V) /  | Feurer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites

None

Annotation

For further information please contact the Marketing & Sales Research Group (marketing.iism.kit.edu).

Below you will find excerpts from events related to this course:

V

International Marketing

2572155, WS 20/21, 1 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

Doing marketing abroad creates a number of significant new challenges for firms. This class is intended to prepare you for meeting these challenges. In the first session, we will discuss the peculiarities of international marketing. The next five sessions will then be dedicated to methods that can be used to address them. For instance, we will look at the following issues:

- Internationalization strategies
- Market entry strategies
- Standardization vs. individualization (e.g. regarding products, prices, and communication)
- Measurement equivalence in international market research

In the final session, we will apply this knowledge to the case of Wal Mart. In particular, Wal Mart, despite being the largest retailing company worldwide, failed to successfully enter the German Market. We will discuss Wal Mart's failure using the methods taught in the weeks before.

Students

- know the characteristics of international marketing
- are familiar with the Hofstede's cultural dimensions theory
- understand basic concepts of cultural learning (the concept of acculturation, the psychic distance paradox)
- know different concepts that explain international buying behavior (e.g. country-of-origin effects)
- comprehend different concepts for market entries in an international context ("waterfall"-strategy, "sprinkler"-strategy, method of analogy, chain ratio method)
- understand what needs to be considered regarding international market research (dealing with ethical dilemmas, challenges regarding primary and secondary data sources, testing measurement equivalence, linguistic equivalence, differences in the response styles of questionnaires)
- know the particularities of international product policy (standardization vs. differentiation, challenge of branding, fight against product plagiarism, brand counterfeiting and product piracy, protection of intellectual property)
- are familiar with the particularities in the international price policy (BigMac Index, how to deal with price demand functions to achieve profit maximization, arbitrage, price corridor, standardization vs. differentiation of prices, how to deal with currency risks, inflation, exchange rates and different willingness to pay)
- know the characteristics of the international communication policy (different laws, problems regarding international standardized campaigns)
- know particularities of the international sales policy (international channels, differences of contract negotiations)
- are able to organize international marketing departments and subsidiaries
- know the problems of marketing in emerging markets

The assessment consists of a written exam (60 minutes) (following S4(2), 1 of the examination regulation).

The total workload for this course is approximately 45.0 hours. For further information see German version.

For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Literature

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T 7.119 Course: Internship [T-WIWI-102611]

Responsible: Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101419 - Internship](#)

| Type | Credits | Version |
|----------------------|---------|---------|
| Completed coursework | 10 | 2 |

Competence Certificate
see module description

Prerequisites
Kein


T





7.120 Course: Introduction to Ceramics [T-MACH-100287]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 6 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|----------|
| WS 20/21 | 2125757 | Introduction to Ceramics | 3 SWS | Lecture (V) /  | Hoffmann |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Organizational issues

Die Veranstaltung findet online statt.

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

7.121 Course: Introduction to Energy Economics [T-WIWI-102746]

Responsible: Prof. Dr. Wolf Fichtner
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101464 - Energy Economics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5,5 | Each summer term | 4 |

| Events | | | | | |
|---------|---------|--|-------|--------------|----------------------------|
| SS 2020 | 2581010 | Introduction to Energy Economics | 2 SWS | Lecture (V) | Fichtner |
| SS 2020 | 2581011 | Übungen zu Einführung in die Energiewirtschaft | 2 SWS | Practice (Ü) | Lehmann, Sandmeier, Ardone |

Competence Certificate

The assessment consists of a written exam (90 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites

None.

Below you will find excerpts from events related to this course:

V

Introduction to Energy Economics

2581010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

1. Introduction: terms, units, conversions
2. The energy carrier gas (reserves, resources, technologies)
3. The energy carrier oil (reserves, resources, technologies)
4. The energy carrier hard coal (reserves, resources, technologies)
5. The energy carrier lignite (reserves, resources, technologies)
6. The energy carrier uranium (reserves, resources, technologies)
7. The final carrier source electricity
8. The final carrier source heat
9. Other final energy carriers (cooling energy, hydrogen, compressed air)

The student is able to

- characterize and judge the different energy carriers and their peculiarities,
- understand contexts related to energy economics.

Literature**Weiterführende Literatur:**


Pfaffenberger, Wolfgang. Energiewirtschaft. ISBN 3-486-24315-2
 Feess, Eberhard. Umweltökonomie und Umweltpolitik. ISBN 3-8006-2187-8
 Müller, Leonhard. Handbuch der Elektrizitätswirtschaft. ISBN 3-540-67637-6
 Stoft, Steven. Power System Economics. ISBN 0-471-15040-1
 Erdmann, Georg. Energieökonomik. ISBN 3-7281-2135-5

T

7.122 Course: Introduction to Engineering Geology [T-BGU-101500]

Responsible: Prof. Dr. Philipp Blum**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|------|
| WS 20/21 | 6339057 | Einführung in die Ingenieurgeologie | 4 SWS | Lecture / Practice (VÜ) /  | Blum |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Prerequisites**

none

T

7.123 Course: Introduction to Engineering Mechanics I: Statics and Strength of Materials [T-MACH-102208]

Responsible: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering
Part of: [M-MACH-101259 - Engineering Mechanics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|---------------|
| SS 2020 | 2162238 | Introduction to Engineering Mechanics I: Statics and Strength of Materials | 2 SWS | Lecture (V) | Fidlin |
| SS 2020 | 2162239 | Introduction to Engineering Mechanics I: Statics and Strength of Materials (Tutorial) | 1 SWS | Practice (Ü) | Fidlin, Altoé |

Competence Certificate

The assessment consists of a written examination (120 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place in every semester. Re-examinations are offered at every ordinary examination date.

For students of economics the assesment consists of a written examination (Statics - 75 min.)

Permitted utilities: non-programmable calculator

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Introduction to Engineering Mechanics I: Statics and Strength of Materials

Lecture (V)

2162238, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Content

Statics: force · moment · general equilibrium condistions · center of mass · inner force in structure · plane frameworks · theory of adhesion


T


7.124 Course: Introduction to Engineering Mechanics II : Dynamics [T-MACH-102210]

Responsible: Prof. Dr.-Ing. Alexander Fidlin
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|---------------|
| WS 20/21 | 2161276 | Introduction to Engineering Mechanics II : Dynamics | 2 SWS | Lecture (V) /  | Fidlin, Römer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written examination (75 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination is offered every semester. Re-examinations are offered at every ordinary examination date.

Permitted utilities: non-programmable calculator, literature.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Introduction to Engineering Mechanics II : Dynamics
 2161276, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
 Online

T

7.125 Course: Introduction to Game Theory [T-WIWI-102850]

Responsible: Prof. Dr. Clemens Puppe
Prof. Dr. Johannes Philipp Reiß

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101499 - Applied Microeconomics](#)
[M-WIWI-101501 - Economic Theory](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-------|
| SS 2020 | 2520525 | Introduction to Game Theory | 2 SWS | Lecture (V) | Puppe |
| SS 2020 | 2520526 | Übungen zu Einführung in die Spieltheorie | 1 SWS | Practice (Ü) | Puppe |

Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation.

The exam takes place in the recess period and can be resited at every ordinary examination date.

Prerequisites

The course Economics I: Microeconomics [2610012] must have been successfully completed.

Recommendation

Basic knowledge of mathematics and statistics is assumed.

Below you will find excerpts from events related to this course:

V

Introduction to Game Theory

2520525, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course focusses on non-cooperative game theory. It discusses models, solution concepts, and applications for simultaneous games as well as sequential games. Various solution concepts, e.g., Nash equilibrium and subgame-perfect equilibrium, are introduced along with more advanced concepts. A short introduction to cooperative game theory is given if there is sufficient time.

The assessment consists of a written exam (60 minutes) according to Section 4(2),1 of the examination regulation.

The exam takes place in the recess period and can be resited at every ordinary examination date.

The module [M-WIWI-101398] *Introduction to Economics* must have been passed.

Recommendations:

Basic knowledge of mathematics and statistics is assumed.

The total workload for this course is approximately 135.0 hours. For further information see German version.

This course offers an introduction to the theoretical analysis of strategic interaction situations. At the end of the course, students shall be able to analyze situations of strategic interaction systematically and to use game theory to predict outcomes and give advice in applied economics settings.

Compulsory textbook:

Gibbons (1992): *A Primer in Game Theory*, Harvester-Wheatsheaf.

Additional Literature:

Berninghaus/Ehrhart/Güth (2010): *Strategische Spiele*, Springer Verlag.

Binmore (1991): *Fun and Games*, DC Heath.

Fudenberg/Tirole (1991): *Game Theory*, MIT Press.

Heifetz (2012): *Game Theory*, Cambridge Univ. Press.

Literature

Verpflichtende Literatur:

Gibbons (1992): A Primer in Game Theory, Harvester-Wheatsheaf.

Ergänzende Literatur:

Berninghaus/Ehrhart/Güth (2010): Strategische Spiele, Springer Verlag.

Binmore (1991): Fun and Games, DC Heath.

Fudenberg/Tirole (1991): Game Theory, MIT Press.

Heifetz (2012): Game Theory, Cambridge Univ. Press.

T


7.126 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences [T-BGU-101681]

Responsible: Dr.-Ing. Norbert Rösch
Dr.-Ing. Sven Wursthorn

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |


| Events | | | | | |
|----------|---------|--|-------|---|-----------|
| WS 20/21 | 6071101 | Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü | 4 SWS | Lecture / Practice (VÜ) /  | Wursthorn |





Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T 7.127 Course: Introduction to GIS for Students of Natural, Engineering and Geo Sciences, Prerequisite [T-BGU-103541]

Responsible: Dr.-Ing. Norbert Rösch
 Dr.-Ing. Sven Wursthorn
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| | | | |
|-------------------------------------|---------------------|---------------------------------------|---------------------|
| Type Completed coursework | Credits 3 | Recurrence Each winter term | Version 1 |
|-------------------------------------|---------------------|---------------------------------------|---------------------|

| Events | | | | | |
|----------|---------|--|-------|---|-----------|
| WS 20/21 | 6071101 | Einführung in GIS für Studierende natur-, ingenieur- und geowissenschaftlicher Fachrichtungen, V/Ü | 4 SWS | Lecture / Practice (VÜ) /  | Wursthorn |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.128 Course: Introduction to Machine Learning [T-WIWI-111028]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Dr. Abdolreza Nazemi

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-105482 - Machine Learning and Data Science](#)

| Type | Credits | Recurrence | Expansion | Version |
|---------------------|---------|------------------|-----------|---------|
| Written examination | 4,5 | Each winter term | 1 terms | 1 |

| Events | | | | | |
|----------|---------|---|-------|--------------|--------|
| WS 20/21 | 2540539 | Introduction to Machine Learning | 2 SWS | Lecture (V) | Nazemi |
| WS 20/21 | 2540540 | Übung zu Introduction to 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-point-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.

Below you will find excerpts from events related to this course:

V

Introduction to Machine Learning

2540539, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

- Introduction
- Data Cleaning
- Data Visualization
- Linear Regression
- Logistic Regression
- Tree-based Algorithms
- Support Vector Machine
- Shrinkage Models
- Dimensionality Reduction
- Clustering

Literature

- Alpaydin, E. (2014). *Introduction to Machine Learning*. Third Edition, MIT Press.
- Hall, J. (2020). *Machine Learning in Business: An Introduction to the World of Data Science*. Independently published.
- James, G., Witten, D., Hastie, T., and R. Tibshirani (2013). *An Introduction to Statistical Learning: with Applications in R*. Springer.
- Tan, P. N., Steinbach, M., Karpatne, A., & Kumar, V. (2018). *Introduction to data mining*. Pearson

T

7.129 Course: Introduction to Microsystem Technology I [T-MACH-105182]

Responsible: Dr. Vlad Badilita
Dr. Mazin Jouda
Prof. Dr. Jan Gerrit Korvink

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|-------------|-------------------|
| WS 20/21 | 2141861 | Introduction to Microsystem Technology I | 2 SWS | Lecture (V) | Korvink, Badilita |

Competence Certificate
written examination (60 min)

Prerequisites
none

Below you will find excerpts from events related to this course:

V

Introduction to Microsystem Technology I

2141861, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Literature

Mikrosystemtechnik für Ingenieure, W. Menz und J. Mohr, VCH Verlagsgesellschaft, Weinheim 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T

7.130 Course: Introduction to Microsystem Technology II [T-MACH-105183]

Responsible: Dr. Mazin Jouda
Prof. Dr. Jan Gerrit Korvink

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-------------------|
| SS 2020 | 2142874 | Introduction to Microsystem Technology II | 2 SWS | Lecture (V) | Korvink, Badilita |

Competence Certificate
written examination (60 min)

Prerequisites
none

Below you will find excerpts from events related to this course:

V

Introduction to Microsystem Technology II

2142874, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

- Introduction in Nano- and Microtechnologies
- Lithography
- LIGA-technique
- Mechanical microfabrication
- Patterning with lasers
- Assembly and packaging
- Microsystems

Literature

Menz, W., Mohr, J., O. Paul: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 2005

M. Madou

Fundamentals of Microfabrication

Taylor & Francis Ltd.; Auflage: 3. Auflage. 2011

T

7.131 Course: Introduction to Neural Networks and Genetic Algorithms [T-WIWI-111029]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-105482 - Machine Learning and Data Science](#)

| Type | Credits | Recurrence | Expansion | Version |
|---------------------|---------|------------------|-----------|---------|
| Written examination | 4,5 | Each summer term | 1 terms | 1 |

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-point-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.

T



7.132 Course: Introduction to Operations Research I and II [T-WIWI-102758]





Responsible: Prof. Dr. Stefan Nickel
 Prof. Dr. Steffen Rebennack
 Prof. Dr. Oliver Stein

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101418 - Introduction to Operations Research](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|-----------------|---------|
| Written examination | 9 | see Annotations | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-------------------|
| SS 2020 | 2550040 | Introduction to Operations Research I | 2 SWS | Lecture (V) | Rebennack |
| WS 20/21 | 2530043 | Introduction to Operations Research II | 2 SWS | Lecture (V) /  | Rebennack |
| WS 20/21 | 2530044 | | SWS | Tutorial (Tu) /  | Rebennack, Sinske |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment of the module is carried out by a written examination (120 minutes) according to Section 4(2), 1 of the examination regulation.

In each term (usually in March and July), one examination is held for both courses.

The overall grade of the module is the grade of the written examination.

Prerequisites

None

Recommendation

Mathematics I and II. Programming knowledge for computing exercises.

It is strongly recommended to attend the course *Introduction to Operations Research I* [2550040] before attending the course *Introduction to Operations Research II* [2530043].

Below you will find excerpts from events related to this course:

V

Introduction to Operations Research I

2550040, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Examples for typical OR problems.

Linear Programming: Basic notions, simplex method, duality, special versions of the simplex method (dual simplex method, three phase method), sensitivity analysis, parametric optimization, game theory.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal and minimal cost flows in networks.

Learning objectives:

The student

- names and describes basic notions of linear programming as well as graphs and networks,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

Literature

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

V

Introduction to Operations Research II2530043, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)
Online****Content**

Integer and Combinatorial Programming: Basic notions, cutting plane methods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dynamical and stochastic inventory models, queuing theory.

Learning objectives:

The student

- names and describes basic notions of integer and combinatorial optimization, nonlinear programming, and dynamic programming,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve optimization problems independently,
- validates, illustrates and interprets the obtained solutions.

Literature

- Nickel, Stein, Waldmann: Operations Research, 2. Auflage, Springer, 2014
- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005
- Murty: Operations Research. Prentice-Hall, 1995
- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006
- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

**7.133 Course: Introduction to Programming with Java [T-WIWI-102735]**

Responsible: Prof. Dr.-Ing. Johann Marius Zöllner
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101581 - Introduction to Programming](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|-----------------|----------------------------|
| WS 20/21 | 2511000 | Introduction to Programming with Java | 3 SWS | Lecture (V) / | Zöllner, Struppek, Hermann |
| WS 20/21 | 2511002 | Tutorien zu Programmieren I: Java | 1 SWS | Tutorial (Tu) / | Zöllner, Struppek, Ulrich |
| WS 20/21 | 2511003 | Computer lab Introduction to Programming with Java | 2 SWS | / | Zöllner, Struppek, Ulrich |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written resp. computer-based exam (60 min) according to Section 4 (2),1 of the examination regulation.

The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.

The examination takes place every semester. Re-examinations are offered at every ordinary examination date.

Annotation

see german version

Below you will find excerpts from events related to this course:

**Introduction to Programming with Java**

2511000, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture "Introduction to Programming with Java " introduces systematic programming and provides essential practical basics for all advanced computer science lectures.

Based on considerations of the structured and systematic design of algorithms, the most important constructs of modern higher programming languages as well as programming methods are explained and illustrated with examples. One focus of the lecture is on teaching the concepts of object-oriented Programming. Java is used as the programming language. Knowledge of this language is required in advanced computer science lectures.

At the end of the lecture period, a written examination will be held for which admission must be granted during the semester after successful participation in the practices. The exact details will be announced in the lecture.

Learning objectives:

- Knowledge of the fundamentals, methods and systems of computer science.
- The students acquire the ability to independently solve algorithmic problems in the programming language Java, which dominates in business applications.
- In doing so, they will be able to find strategic and creative answers in finding solutions to well-defined, concrete and abstract problems.

Workload:

The total workload for this course is approximately 150 hours. For further information see German version.

Literature

Ratz, D. Schulmeister-Zimolong, D. Seese, J. Wiesenberger. Grundkurs Programmieren in Java. 8. Aktualisierte und erweiterte Auflage, Hanser 2018

**7.134 Course: Introduction to Public Finance [T-WIWI-102877]**

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101403 - Public Finance](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---------------|--------|
| WS 20/21 | 2560131 | Introduction to Public Finance | 3 SWS | Lecture (V) / | Wigger |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (60 min.).

Prerequisites

None

Below you will find excerpts from events related to this course:

**Introduction to Public Finance**

2560131, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The course *Introduction to Public Finance* provides an overview of the fundamental issues in public economics. The first part of the course deals with normative theories about the economic role of the state in a market economy. Welfare economics theory is offered as a base model, with which alternative normative theories are compared and contrasted. Within this theoretical framework, arguments concerning efficiency and equity are developed as justification for varying degrees of economic intervention by the state. The second part of the course deals with the positivist theory of public economics. Processes of public decision making are examined and the conditions that lead to market failures resulting from collective action problems are discussed. The third part of the course examines a variety of public spending programs, including social security systems, the public education system, and programs aimed at reducing poverty. The fifth part of the course addresses the key theoretical and political issues associated with fiscal federalism.

Learning goals:

Students are able to:

- critically assess the economic role of the state in a market economy
- explain and discuss key concepts in public finance, including: public goods; economic externalities; and market failure
- explain and critically discuss competing theoretical approaches to public finance, including welfare economics and public choice theory
- explain the theory of bureaucracy according to Weber and critically assess its strengths and weaknesses
- evaluate the incentives inherent in the bureaucratic model, as well as the more recent introduction of market-oriented incentives associated with public-sector reform

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Organizational issues

Donnerstag 14:00-15:30 Uhr per Zoom-Livestream

Literature

Literatur:

Wigger, B. U. 2006. *Grundzüge der Finanzwissenschaft*. Springer: Berlin.

T

7.135 Course: Introduction to Stochastic Optimization [T-WIWI-106546]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)
[M-WIWI-103278 - Optimization under Uncertainty](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|-------------------|
| SS 2020 | 2550470 | Einführung in die Stochastische Optimierung | 2 SWS | Lecture (V) | Rebennack |
| SS 2020 | 2550471 | Übung zur Einführung in die Stochastische Optimierung | 1 SWS | Practice (Ü) | Rebennack, Sinske |
| SS 2020 | 2550474 | Rechnerübung zur Einführung in die Stochastische Optimierung | SWS | Practice (Ü) | Rebennack, Sinske |

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.

**7.136 Course: Investments [T-WIWI-102604]**

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101435 - Essentials of Finance](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--------------------------------------|-------|--------------|-------------------------|
| SS 2020 | 2530575 | Investments | 2 SWS | Lecture (V) | Uhrig-Homburg, Thimme |
| SS 2020 | 2530576 | Übung zu Investments | 1 SWS | Practice (Ü) | Uhrig-Homburg, Eberbach |

Competence Certificate

The assessment consists of a written exam (75 min) according to Section 4(2), 1 of the examination regulation. The examination takes place in every semester. Re-examinations are offered at every ordinary examination date. A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by up to one grade level (0.3 or 0.4). Details will be announced in the lecture.

Prerequisites

None

Recommendation

Knowledge of Business Administration: Finance and Accounting [2610026] is recommended.

Below you will find excerpts from events related to this course:

**Investments**

2530575, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature**Weiterführende Literatur:**

Bodie/Kane/Marcus (2010): Essentials of Investments, 8. Aufl., McGraw-Hill Irwin, Boston

T

7.137 Course: Laboratory Production Metrology [T-MACH-108878]**Responsible:** Dr.-Ing. Benjamin Häfner**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|----------------------|--------|
| SS 2020 | 2150550 | Laboratory Production Metrology | 3 SWS | Practical course (P) | Häfner |

Competence Certificate

Alternative Test Achievement: Group presentation of 15 min at the beginning of each experiment and evaluation of the participation during the experiments

and

Oral Exam (15 min)

Prerequisites

none

Annotation

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Below you will find excerpts from events related to this course:

V

Laboratory Production Metrology

2150550, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

During this course, students get to know measurement systems that are used in a production system. In the age of Industry 4.0, sensors are becoming more important. Therefore, the application of in-line measurement technology such as machine vision and non-destructive testing is focussed. Additionally, laboratory based measurement technologies such as computed tomography are addressed. The students learn the theoretical background as well as practical applications for industrial examples. The students use sensors by themselves during the course. Additionally, they are trained on how to integrate sensors in production processes and how to analyze measurement data with suitable software.

The following topics are addressed:

- Classification and examples for different measurement technologies in a production environment
- Machine vision with optical sensors
- Information fusion based on optical measurements
- Robot-based optical measurements
- Non-destructive testing by means of acoustic measurements
- Coordinate measurement technology
- Industrial computed tomography
- Measurement uncertainty evaluation
- Analysis of production data by means of data mining

Learning Outcomes:

The students ...

- are able to name, describe and mark out different measurement technologies that are relevant in a production environment.
- are able to conduct measurements with the presented in-line and laboratory based measurement systems.
- are able to analyze measurement results and assess the measurement uncertainty of these.
- are able to deduce whether a work piece fulfills quality relevant specifications by analysing measurement results.
- are able to use the presented measurement technologies for a new task.

Workload:

regular attendance: 31,5 hours

self-study: 88,5 hours

Organizational issues

Die Lehrveranstaltung findet stets dienstags nachmittags statt.

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

The course always takes place on Tuesdays in the afternoon.

For organizational reasons the number of participants for the course is limited. Hence a selection process will take place. Applications are made via the homepage of wbk (<http://www.wbk.kit.edu/studium-und-lehre.php>).

Literature

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt. Ebenso wird auf gängige Fachliteratur verwiesen.


Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>). Additional reference to literature will be provided, as well.

T

7.138 Course: Learning Factory "Global Production" [T-MACH-105783]

Responsible: Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 6 | Each winter term | 4 |

| Events | | | | | |
|----------|---------|--|-------|--|-------|
| WS 20/21 | 2149612 | Learning Factory "Global Production" | 4 SWS | /  | Lanza |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Alternative test achievement (graded):

- Knowledge acquisition in the context of the seminar (4 achievements 20 min each) with weighting 40%.
- Interaction between participants with weighting 15%.
- Scientific colloquium (in groups of 3 students approx. 45 min each) with weighting 45%.

Prerequisites

none

Annotation

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/lernfabrik.php>).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

Below you will find excerpts from events related to this course:

V

Learning Factory "Global Production"2149612, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

On-Site

Content

The learning factory "Global Production" serves as a modern teaching environment for the challenges of global production. These are made tangible using the example of the manufacture of electric motors under real production conditions.

The course is characterized by its interactive hands-on sessions, which are theoretically supported by e-learning units. The e-learning units serve to convey essential basics as well as to deepen specific topics from the classroom units (e.g. site selection, supplier selection and planning of production networks). The focus of the hands-on sessions is the case-specific application of relevant methods for planning and managing global production networks.

First, classical methods and tools of Lean Management for the site-specific design of the production system (e.g. Kanban and JIT/JIS, Line Balancing) are learned and extended by methods of Industry 4.0. Within the scope of site-specific quality assurance, essential methods for data-driven quality assurance in complex production systems are taught and made practically tangible by means of a Six Sigma project. The focus is especially on methods of data mining with an excursus on artificial intelligence. 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. Finally, the view of the entire value chain network will be broadened by the integration of partners from the value chain. Thereby selected methods of supplier management (e.g. make-or-buy) and network design are learned and implemented. In the field of network management, collaboration between value chain partners and locations is considered a tool for increasing efficiency and avoiding disruptions. The special importance of digitisation as an enabler of collaboration is illustrated by the implementation of a traceability concept.

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
- Lean Management and Industry 4.0
- Six Sigma 4.0 - Data Mining for Site-Specific Quality Assurance
- Scalable Automation and Human-Robot Collaboration
- Supplier Management
- Network Planning and Design
- Collaboration and Traceability

Learning Outcomes:

The students are able to ...

- evaluate and select alternative locations using appropriate methods.
- use methods and tools of lean management to plan and manage production systems that are suitable for the location.
- use the Six Sigma method and apply goal-oriented process management.
- Derive automation potentials and systematically decide on a suitable degree of automation of production plants under given constraints.
- make use of well-established methods for the evaluation and selection of suppliers.
- apply methods for planning a global production network depending on company-specific circumstances to sketch a suitable network and classify and evaluating it according to specific criteria.
- understand general interactions in the production network and effectively develop collaboration in the production Environment
- apply the learned methods and approaches with regard to problem solving in a global production environment and able to reflect their effectiveness.

Workload:

e-Learning: ~ 36 h

regular attendance: ~ 64 h

self-study: ~ 80 h

Organizational issues

Termine werden über die Institutshomepage bekanntgegeben.

Aus organisatorischen Gründen ist die Teilnehmerzahl für die Lehrveranstaltung auf 15 Teilnehmer begrenzt. Infolgedessen wird ein Auswahlprozess stattfinden. Die Bewerbung erfolgt über die Homepage des wbk (<http://www.wbk.kit.edu/lernfabrik.php>)

Aufgrund der begrenzten Teilnehmerzahl ist eine Voranmeldung erforderlich.

Die Studierenden sollten Vorkenntnisse in mindestens einem der folgenden Bereiche haben:

- Integrierte Produktionsplanung
- Globale Produktion und Logistik
- Qualitätsmanagement

Dates will be announced on the homepage of the institute.

For organisational reasons, the number of participants for the course is limited to 20. As a result, a selection process will take place. Applications must be submitted via the wbk homepage (<http://www.wbk.kit.edu/lernfabrik.php>).

Due to the limited number of participants, advance registration is required.

Students should have previous knowledge in at least one of the following areas:

- Integrated Production Planning
- Global Production and Logistics
- Quality Management

Literature**Medien:**

E-Learning Plattform ilias, Powerpoint, Fotoprotokoll. Die Medien werden über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

E-learning platform ilias, powerpoint, photo protocol. The media are provided through ilias (<https://ilias.studium.kit.edu/>).

T

7.139 Course: Logistics and Supply Chain Management [T-WIWI-102870]

Responsible: Prof. Dr. Frank Schultmann
Dr. Marcus Wiens

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101437 - Industrial Production I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|-----------------------|
| SS 2020 | 2581996 | Logistics and Supply Chain Management | 2 SWS | Lecture (V) | Wiens, Schultmann |
| SS 2020 | 2581997 | Übung zu Logistics and Supply Chain Management | 1 SWS | Practice (Ü) | Diehlmann, Lüttenberg |

Competence Certificate

The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Logistics and Supply Chain Management

2581996, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

Students are introduced to the methods and tools of logistics and supply chain management. They students learn the key terms and components of supply chains together with key economic trade-offs. In detail, students gain knowledge of decisions in supply chain management, such as facility location, supply chain planning, inventory management, pricing and supply chain cooperation. In this manner, students will gain knowledge in analyzing, designing and steering of decisions in the domain of logistics and supply chain management.

- Introduction: Basic terms and concepts
- Facility location and network optimization
- Supply chain planning I: flexibility
- Supply chain planning II: forecasting
- Inventory management & pricing
- Supply chain coordination I: the Bullwhip-effect
- Supply chain coordination II: double marginalization
- Supply chain risk management


Literature

Wird in der Veranstaltung bekannt gegeben.

T

7.140 Course: Logistics and Supply Chain Management [T-MACH-110771]**Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-105298 - Logistics and Supply Chain Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|---|---------|
| SS 2020 | 2118078 | Logistics and Supply Chain Management | 4 SWS | Lecture (V) /  | Furmans |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

The assessment consists of a written examination (according to §4(2), 1 of the examination regulation).

Prerequisites

None

Annotation

The brick cannot be taken if one of the bricks "T-MACH-102089 - Logistics - Organisation, Design and Control of Logistic Systems" and "T-MACH-105181 - Supply Chain Management" has been taken.

Below you will find excerpts from events related to this course:

V

Logistics and Supply Chain Management2118078, SS 2020, 4 SWS, Language: English, [Open in study portal](#)**Lecture (V)
Blended (On-Site/Online)****Content**

In the lecture "Logistics and Supply Chain Management", comprehensive and well-founded fundamentals of crucial issues in logistics and supply chain management are presented. Furthermore, the interaction of different design elements of supply chains is emphasized. For this purpose, both qualitative and quantitative models are presented and applied. Additionally, methods for mapping and evaluating logistics systems and supply chains are described. The contents of the lecture are deepened in exercises and case studies and comprehension is partially reviewed in case studies. The contents will be illustrated, among other things, on the basis of supply chains in the automotive industry.

Among others, the following topics are covered:

- Inventory Management
- Forecasting
- Bullwhip Effect
- Supply Chain Segmentation and Collaboration
- Key Performance Indicators
- Supply Chain Risk Management
- Production Logistics
- Location Planning
- Route Planning

T


7.141 Course: Machine Tools and High-Precision Manufacturing Systems [T-MACH-110963]


Responsible: Prof. Dr.-Ing. Jürgen Fleischer

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101286 - Machine Tools and Industrial Handling](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|-----------|
| WS 20/21 | 2149910 | Machine Tools and High-Precision Manufacturing Systems | 6 SWS | Lecture / Practice (VÜ) /  | Fleischer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written exam (120 minutes)

Prerequisites

T-MACH-102158 - Machine Tools and Industrial Handling must not be commenced.

T-MACH-109055 - Machine Tools and Industrial Handling must not be commenced.

T-MACH-110962 - Machine Tools and High-Precision Manufacturing Systems must not be commenced.

Below you will find excerpts from events related to this course:

V

Machine Tools and High-Precision Manufacturing Systems

2149910, WS 20/21, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
Online

Content

The lecture gives an overview of the construction, use and application of machine tools and high-precision manufacturing systems. In the course of the lecture a well-founded and practice-oriented knowledge for the selection, design and evaluation of machine tools and high-precision manufacturing systems is conveyed. First, the main components of the systems are systematically explained and their design principles as well as the integral system design are discussed. Subsequently, the use and application of machine tools and high-precision manufacturing systems 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:

- Structural components of dynamic manufacturing Systems
- Feed axes: High-precision positioning
- Spindles of cutting machine Tools
- Peripheral Equipment
- Machine control unit
- Metrological Evaluation
- Maintenance strategies and condition Monitoring
- Process Monitoring
- Development process for machine tools and high-precision manufacturing Systems
- Machine examples

Learning Outcomes:

The students ...

- are able to assess the use and application of machine tools and high-precision manufacturing systems and to differentiate between them in terms of their characteristics and design.
- can describe and discuss the essential elements of machine tools and high-precision manufacturing systems (frame, main spindle, feed axes, peripheral equipment, control unit).
- are able to select and dimension the essential components of machine tools and high-precision manufacturing systems.
- are capable of selecting and evaluating machine tools and high-precision manufacturing systems according to technical and economic criteria.

Workload:**MACH:**

regular attendance: 63 hours

self-study: 177 hours

WING/TVWL:

regular attendance: 63 hours

self-study: 207 hours

Organizational issues

Vorlesungstermine montags und mittwochs, Übungstermine donnerstags.

Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung.

Lectures on Mondays and Wednesdays, tutorial on Thursdays.

The tutorial dates will announced in the first lecture.

Literature**Medien:**

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:



Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).





T

7.142 Course: Macroeconomic Theory [T-WIWI-109121]

Responsible: Prof. Dr. Johannes Brumm
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101501 - Economic Theory](#)
[M-WIWI-101668 - Economic Policy I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|---|-------|--|----------|
| WS 20/21 | 2560404 | Macroeconomic Theory | 2 SWS | Lecture (V) /  | Scheffel |
| WS 20/21 | 2560405 | Übung zu Macroeconomic Theory | 1 SWS | Practice (Ü) /  | Pegorari |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

Prerequisites

None.

Below you will find excerpts from events related to this course:

V

Macroeconomic Theory

2560404, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Literature

Literatur und Skripte werden in der Veranstaltung angegeben.

**7.143 Course: Management Accounting 1 [T-WIWI-102800]**

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101498 - Management Accounting](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|---------|
| SS 2020 | 2579900 | Management Accounting 1 | 2 SWS | Lecture (V) | Wouters |
| SS 2020 | 2579901 | Übung zu Management Accounting 1 (Bachelor) | 2 SWS | Practice (Ü) | Riar |
| SS 2020 | 2579902 | | 2 SWS | Practice (Ü) | Riar |

Competence Certificate

The assessment consists of a written exam (120 minutes) (following §4(2), 1 of the examination regulation) at the end of each semester.

Prerequisites

None

Annotation

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

Below you will find excerpts from events related to this course:

**Management Accounting 1**

2579900, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

Content

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA1 are: short-term planning, investment decisions, budgeting and activity-based costing.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Learning objectives:

- Students have an understanding of theory and applications of management accounting topics.
- They can use financial information for various purposes in organizations.

Examination:

- The assessment consists of a written exam (120 minutes) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

Workload:

- The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Publisher: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- In addition, several papers that will be available on ILIAS.

**Übung zu Management Accounting 1 (Bachelor)**2579901, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Content**

see Module Handbook

2579902, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Practice (Ü)****Content**




see Module Handbook

T

7.144 Course: Management Accounting 2 [T-WIWI-102801]

Responsible: Prof. Dr. Marcus Wouters
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101498 - Management Accounting](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|---|-------|--|---------|
| WS 20/21 | 2579903 | Management Accounting 2 | 2 SWS | Lecture (V) /  | Wouters |
| WS 20/21 | 2579904 | | 2 SWS | Practice (Ü) /  | Ebinger |
| WS 20/21 | 2579905 | | 2 SWS | Practice (Ü) /  | Ebinger |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (120 minutes) at the end of each semester.

Prerequisites

None

Recommendation

It is recommended to take part in the course "Management Accounting 1" before this course.

Annotation

Students in the Bachelor' program can only take the related tutorial and examination. Students in the Master's program (and Bachelor's students who are already completing examinations for their Master's program) can only take the related tutorial and examination.

Below you will find excerpts from events related to this course:

V

Management Accounting 2

2579903, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

The course covers topics in management accounting in a decision-making framework. Some of these topics in the course MA2 are: cost estimation, product costing and cost allocation, financial performance measures, transfer pricing, strategic performance measurement systems.

We will use international material written in English.

We will approach these topics primarily from the perspective of the users of financial information (not so much from the controller who prepares the information).

The course builds on an introductory level of understanding of accounting concepts from Business Administration courses in the core program. The course is intended for students in Industrial Engineering.

Learning objectives:

- Students have an understanding of theory and applications of management accounting topics. They can use financial information for various purposes in organizations.

Recommendations:

- It is recommended to take part in the course "Management Accounting 1" before this course.

Examination:

- The assessment consists of a written exam (120 min) at the end of each semester (following § 4 (2) No. 1 of the examination regulation).

Workload:

- The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Marc Wouters, Frank H. Selto, Ronald W. Hilton, Michael W. Maher: Cost Management – Strategies for Business Decisions, 2012, Verlag: McGraw-Hill Higher Education (ISBN-13 9780077132392 / ISBN-10 0077132394)
- Zusätzlich werden Artikel auf ILIAS zur Vergütung gestellt.



2579904, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Practice (Ü)
Online**

Content
see ILIAS



2579905, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Practice (Ü)
Online**

Content
see ILIAS

**7.145 Course: Management and Strategy [T-WIWI-102629]**

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101425 - Strategy and Organization](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-----------|
| SS 2020 | 2577900 | Management and Strategy | 2 SWS | Lecture (V) | Lindstädt |

Competence Certificate

The assessment consists of a written exam (60 min) taking place at the beginning of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

**Management and Strategy**

2577900, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The participants learn about central concepts of strategic management along the ideal-typical strategy process: internal and external strategic analysis, concept and sources of competitive advantages, their importance when establishing competitive and corporate strategies as well as strategy assessment and implementation. This aims in particular to provide a summary of the basic concepts and models of strategic management, i.e. to provide in particular an action-oriented integration. Thereby a focus is on imparting knowledge about how price developments in oligopolistic markets can be understood, modeled and forecasted based on game theory.

Content in brief:

- Corporate management principles
- Strategic management principles
- Strategic analysis
- Competitive strategy: modelling and selection on a divisional level
- Strategies for oligopolies and networks: anticipation of dependencies
- Corporate strategy: modelling and evaluation on a corporate level
- Strategy implementation

Learning Objectives:

After passing this course students are able to

- prepare strategic decisions along the ideal-typical strategy process in practice ("strategic analysis").
- assess strategic options.
- explain the portfolio management (Parental advantage and best owner of business entities).
- discuss price and capacity decisions in oligopolies and explain them in examples.

Recommendations:

None.

Workload:

The total workload for this course is approximately 105.0 hours. For further information see German version.

Assessment:

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Literature

- Pidun, U.: *Corporate Strategy: Theory and Practice*. Springer-Gabler, Wiesbaden 2019.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche des Unternehmens*. Gabler, Wiesbaden 2004.
- Grant, R.M.: *Strategisches Management*. Pearson Studium, 5., aktualisierte Aufl., München 2006.


Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.

T

7.146 Course: Managing Organizations [T-WIWI-102630]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101425 - Strategy and Organization](#)
[M-WIWI-101513 - Human Resources and Organizations](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|--|-------|---|-----------|
| WS 20/21 | 2577902 | Managing Organizations | 2 SWS | Lecture (V) /  | Lindstädt |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Managing Organizations

2577902, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The course should enable the participants to assess the strengths and weaknesses of existing organisational structures and rules using systematic criteria. Here concepts and models for designing organisation structures, regulating organizational processes and managing organisational changes are presented and discussed using case studies. The course is structured to relate to actions and aims to give students a realistic view of the opportunities and limits of rational design approaches.

Content in brief:

- Principles of organisational management
- Managing organisational structures and processes: the selection of design parameters
- Ideal-typical organisational structures: choice and effect of parameter combinations
- Managing organisational changes

Learning Objectives:

After passing this course students are able to

- evaluate strengths and weaknesses of existing organisational structures and rules.
- compare alternatives of organisational structure in practice and assess and interpret them regarding their effectiveness and efficiency.
- assess the management of organisational changes.

Recommendations:

None.

Workload:

The total workload for this course is approximately 105.0 hours. For further information see German version.

Assessment:

The assessment will consist of a written exam (60 min) taking place at the beginning of the recess period (according to Section 4 (2), 2 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

A bonus can be acquired through successful participation in the exercises. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for the award of a bonus will be announced at the beginning of the lecture.

Literature

- Laux, H.; Liermann, F.: *Grundlagen der Organisation*, Springer. 6. Aufl. Berlin 2005.
- Lindstädt, H.: *Organisation*, in Scholz, C. (Hrsg.): *Vahlens Großes Personallexikon*, Verlag Franz Vahlen. 1. Aufl. München, 2009.
- Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*, Gabler. 4. Aufl. Wiesbaden 2003.

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

T

7.147 Course: Managing the Marketing Mix [T-WIWI-102805]

Responsible: Prof. Dr. Martin Klarmann
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101424 - Foundations of Marketing](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-----------------------|
| SS 2020 | 2571152 | Managing the Marketing Mix | 2 SWS | Lecture (V) | Klarmann |
| SS 2020 | 2571153 | Übung zu Marketing Mix (Bachelor) | 1 SWS | Practice (Ü) | Moosbrugger, Halbauer |

Competence Certificate

The assessment is carried out by the preparation and presentation of a case study (max 30 points) as well as a written exam (max 60 points). In total, a maximum of 90 points can be achieved in the event.

Prerequisites

None

Annotation

The course is compulsory in the module "Foundations of Marketing".
 For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Below you will find excerpts from events related to this course:

V

Managing the Marketing Mix

2571152, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The content of this course concentrates on the elements of the marketing mix. Therefore the main chapters are brand management, pricing, promotion and sales management.

For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

This course is compulsory within or the module "Foundations of Marketing" and must be examined.

Learning objectives:

student

- know the meaning of the branding, the brand positioning and the possibilities of the brand value calculation
- understand the price behavior of customers and can apply this knowledge to the practice
know different methods for price determination (conjoint analysis, cost-plus determination, target costing, customer surveys, value-in-use) and price differentiation
- are able to name and explain the relevant communication theories
- can name and judge different possibilities of the Intermediaplanung
- know various design elements of advertising communication
- understand the measurement of advertising impact and can apply it

Workload:

The total workload for this course is approximately 135.0 hours.

Literature

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T


7.148 Course: Manufacturing Technology [T-MACH-102105]





Responsible: Prof. Dr.-Ing. Volker Schulze
Dr.-Ing. Frederik Zanger

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101276 - Manufacturing Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|--|-------|---|-----------------------|
| WS 20/21 | 2149657 | Manufacturing Technology | 6 SWS | Lecture / Practice (VÜ) /  | Schulze, Gerstenmeyer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Written Exam (180 min)

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Manufacturing Technology

2149657, WS 20/21, 6 SWS, Language: German, [Open in study portal](#)

Lecture / Practice (VÜ)
Online

Content

The objective of the lecture is to look at manufacturing technology within the wider context of production engineering, to provide an overview of the different manufacturing processes and to impart detailed process knowledge of the common processes. The lecture covers the basic principles of manufacturing technology and deals with the manufacturing processes according to their classification into main groups regarding technical and economic aspects. The lecture is completed with topics such as process chains in manufacturing.

The following topics will be covered:

- Quality control
- Primary processing (casting, plastics engineering, sintering, additive manufacturing processes)
- Forming (sheet-metal forming, massive forming, plastics engineering)
- Cutting (machining with geometrically defined and geometrically undefined cutting edges, separating, abrading)
- Joining
- Coating
- Heat treatment and surface treatment
- Process chains in manufacturing

This lecture provides an excursion to an industry company.

Learning Outcomes:

The students ...

- are capable to specify the different manufacturing processes and to explain their functions.
- are able to classify the manufacturing processes by their general structure and functionality according to the specific main groups.
- have the ability to perform a process selection based on their specific characteristics.
- are enabled to identify correlations between different processes and to select a process regarding possible applications.
- are qualified to evaluate different processes regarding specific applications based on technical and economic aspects.
- are experienced to classify manufacturing processes in a process chain and to evaluate their specific influence on surface integrity of workpieces regarding the entire process chain.

Workload:

regular attendance: 63 hours

self-study: 177 hours

Organizational issues

Vorlesungstermine montags und dienstags, Übungstermine mittwochs.

Bekanntgabe der konkreten Übungstermine erfolgt in der ersten Vorlesung.

Start der Vorlesung am 03.11.2020 auf Zoom. Zugangsdaten werden über ILIAS zur Verfügung gestellt.

Literature**Medien:**

Skript zur Veranstaltung wird über ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:




Lecture notes will be provided in ilias (<https://ilias.studium.kit.edu/>).

T

7.149 Course: Material Flow in Logistic Systems [T-MACH-102151]**Responsible:** Prof. Dr.-Ing. Kai Furmans**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101277 - Material Flow in Logistic Systems](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 9 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|---|-------|---|------------------------|
| WS 20/21 | 2117051 | Material flow in logistic systems | 6 SWS | Others (sonst.) /  | Furmans, Jacobi, Klein |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**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 systems2117051, WS 20/21, 6 SWS, Language: German, [Open in study portal](#)Others (sonst.)
Blended (On-Site/Online)

Content**Learning Content:**

- Elements of material flow systems (conveyor elements, fork, join elements)
- Models of material flow networks using graph theory and matrices
- Queueing theory, calculation of waiting time, utilization
- Warehouseing and order-picking
- Shuttle systems
- Sorting systems
- Simulation
- Calculation of availability and reliability
- Value stream analysis

After successful completion of the course, you are able (alone and in a team) to:

- Accurately describe a material handling system in a conversation with an expert.
- Model and parameterize the system load and the typical design elements of a material handling system.
- Design a material handling system for a task.
- Assess the performance of a material handling system in terms of the requirements.
- Change the main lever for influencing the performance.
- Expand the boundaries of today's methods and system components conceptually if necessary.

Literature:

Arnold, Dieter; Furmans, Kai: Materialfluss in Logistiksystemen; Springer-Verlag Berlin Heidelberg, 2009

Description:

Students are divided into groups for this course. Five case studies are carried out in these groups. The results of the group work during the lecture period are presented and evaluated in writing. During the colloquiums, the result of the case study is presented and the understanding of the group work and the models dealt with in the course are tested in an oral defense. The participation in the colloquiums is compulsory and will be controlled. For the written submission and the presentation the group receives a common grade, in the oral defense each group member is evaluated individually.

After the lecture period, there is the final case study. This case study contains the curriculum of the whole semester. The students work individually on this case study which takes place at a predefined place and time (duration: 4h).

We strongly recommend to attend the introductory session at 02.11.2020. In this session, the teaching concept of "Materialfluss in Logistiksysteme" is explained and outstanding issues are clarified.

Registration for the course including group allocation via ILIAS is mandatory. The registration will be activated for several days after the introductory session (registration period: 02.11.2020 08:00 h - 08.11.2020 18:00 h).

Workload:

- Regular attendance: 35 h
- Self-study: 135 h
- Group work: 100 h

Competence Certificate:

The assessment (Prüfungsleistung anderer Art) consists of the following assignments:

- 40% assessment of the final case study as individual performance,
- 60% semester evaluation which includes working on 5 case studies and defending those (For both assessment types, the best 4 of 5 tries count for the final grade.):
 - 40% assessment of the result and the presentation of the case studies as group work,
 - 20% assessment of the oral examination during the colloquiums as individual performance.

Organizational issues

Die Advance Organizer und Übungen werden im Online-Format angeboten. Die Kolloquien finden in Präsenz im Institutsgebäude des IFL (Geb. 50.38) statt.

T

7.150 Course: Material Science II for Business Engineers [T-MACH-102079]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101261 - Emphasis in Fundamentals of Engineering](#)
[M-MACH-101262 - Emphasis Materials Science](#)
[M-WIWI-101839 - Additional Fundamentals of Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|----------|
| SS 2020 | 2126782 | Materials Science II for Business Engineers | 2 SWS | Lecture (V) | Hoffmann |

Competence Certificate

The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the winter term is carried out by a written or oral exam.

Prerequisites

The module *Material Science* has to be completed beforehand.

Below you will find excerpts from events related to this course:

V

Materials Science II for Business Engineers

2126782, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature**Weiterführende Literatur:**

- Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilscher, Springer – Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5
- Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1
- Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0
- Materials Science and Engineering – An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7


T





7.151 Course: Materials Science I [T-MACH-102078]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101260 - Materials Science](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|-------------------------------------|-------|---|------------------|
| WS 20/21 | 2125760 | Materials Science I | 2 SWS | Lecture (V) /  | Hoffmann, Wagner |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written examination (150 min) taking place in the recess period (according to Section 4(2), 1 of the examination regulation). The examination takes place every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Materials Science I

2125760, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Organizational issues

Die Vorlesung findet online statt; erster Termin: 05.11.2020

Literature**Weiterführende Literatur:**

Werkstoffwissenschaften - Eigenschaften, Vorgänge, Technologien, B. Ilscher, Springer – Verlag, Berlin Heidelberg New York, ISBN 3-540-10725-5

Werkstoffwissenschaften, Schatt, Werner / Worch, Hartmut (Hrsg.) Wiley-VCH, Weinheim, ISBN-10: 3-527-30535-1

Metallkunde für das Maschinenwesen I/II, K.G. Schmitt-Thomas, Springer-Verlag, ISBN 3-540-51913-0

Materials Science and Engineering – An Introduction, William D. Callister (Jr.), John Wiley & Son, ISBN-10: 978-0-471-73696-7 .

T

7.152 Course: Mathematics I - Final Exam [T-MATH-102261]

Responsible: Dr. Martin Folkers
Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: [M-MATH-101676 - Mathematics 1](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 3,5 | 1 |

T



7.153 Course: Mathematics I - Midterm Exam [T-MATH-102260]





Responsible: Dr. Martin Folkers
 Prof. Dr. Daniel Hug
 Prof. Dr. Günter Last
 PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: [M-MATH-101676 - Mathematics 1](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 3,5 | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|----------|
| WS 20/21 | 0135000 | Mathematik 1 für die Fachrichtung Wirtschaftswissenschaften | 4 SWS | Lecture (V) /  | Nestmann |
| WS 20/21 | 0135100 | Übungen zu 0135000 | 2 SWS | Practice (Ü) /  | Nestmann |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.154 Course: Mathematics II - Final Exam [T-MATH-102263]

Responsible: Dr. Martin Folkers
Prof. Dr. Daniel Hug
Prof. Dr. Günter Last
PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: [M-MATH-101677 - Mathematics 2](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 3,5 | 1 |

T

7.155 Course: Mathematics II - Midterm Exam [T-MATH-102262]

Responsible: Dr. Martin Folkers
 Prof. Dr. Daniel Hug
 Prof. Dr. Günter Last
 PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: [M-MATH-101677 - Mathematics 2](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 3,5 | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|---------|
| SS 2020 | 0183000 | Mathematik 2 für die Fachrichtung Wirtschaftswissenschaft | 4 SWS | Lecture (V) | Folkers |
| SS 2020 | 0183100 | Übungen zu 0183000 | 2 SWS | Practice (Ü) | Folkers |

T


7.156 Course: Mathematics III - Final Exam [T-MATH-102264]

Responsible: Dr. Martin Folkers
 Prof. Dr. Daniel Hug
 Prof. Dr. Günter Last
 PD Dr. Steffen Winter

Organisation: KIT Department of Mathematics

Part of: [M-MATH-101679 - Mathematics 3](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 7 | 1 |

| Events | | | | | |
|----------|---------|---|-------|--|------|
| WS 20/21 | 0135200 | Mathematik 3 für die Fachrichtung Wirtschaftswissenschaften | 4 SWS | Lecture (V) /  | Last |
| WS 20/21 | 0135300 | Übungen zu 0135200 | 2 SWS | Practice (Ü) /  | Last |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

**7.157 Course: Mechanical Design Basics I and II [T-MACH-110363]**

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101299 - Mechanical Design](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 7 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---------------|------------------------------|
| SS 2020 | 2146131 | Mechanical Design Basics II | 2 SWS | Lecture (V) | Albers, Matthiesen |
| WS 20/21 | 2145131 | Mechanical Design Basics I | 2 SWS | Lecture (V) / | Albers, Matthiesen, Behrendt |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Written Exam (90min) on the topics of MKLGI and MKLGI.

Prerequisites

The bricks "T-MACH-110364 - Mechanical Design Basics I, Tutorial" and "T-MACH-110365 - Mechanical Design Basics II, Tutorial" must be passed successfully.

Below you will find excerpts from events related to this course:

**Mechanical Design Basics II**

2146131, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Design

Dimensioning

Component connections

Bolted connection

Prerequisites:

MIT:

In a workshop with 3 project sessions the students will be divided into groups and their knowledge will be tested. Attendance in all 3 project sessions is compulsory and is checked. In colloquia the knowledge from the lecture will be tested at the beginning of the project sessions. The successful completion of the colloquia as well as the completion of the workshop task is a prerequisite for successful participation.

CIW/VT/IP-M/WiING/NWT/MATH/MWT:

During the lecture, students must apply the knowledge from MKL I and II to a design task. This is then evaluated and must be passed for successful participation.

Workload:

Presence time: 21 h

Self study: 51 h

Literature**Konstruktionselemente des Maschinenbaus - 1 und 2**

Grundlagen der Berechnung und Gestaltung von
Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8)

**Mechanical Design Basics I**

2145131, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Literature**Vorlesungsumdruck:**

Der Umdruck zur Vorlesung kann über die eLearning-Plattform Ilias bezogen werden.

Literatur:**Konstruktionselemente des Maschinenbaus - 1 und 2**

Grundlagen der Berechnung und Gestaltung von
Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

oder Volltextzugriff über Uni-Katalog der Universitätsbibliothek

Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8


T

7.158 Course: Mechanical Design Basics I, Tutorial [T-MACH-110364]

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101299 - Mechanical Design](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 1 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|---|
| WS 20/21 | 2145132 | Tutorials Mechanical Design Basics I | 1 SWS | Practice (Ü) /  | Albers, Matthiesen, Behrendt, Mitarbeiter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

To pass the preliminary work, attendance at 3 workshop sessions of the MKL1 transmission workshop and the passing of a colloquium at the beginning of each workshop are prerequisites.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Tutorials Mechanical Design Basics I

2145132, WS 20/21, 1 SWS, Language: German, [Open in study portal](#)

Practice (Ü)
Online

Literature

Konstruktionselemente des Maschinenbaus - 1 und 2

Grundlagen der Berechnung und Gestaltung von Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

CAD:

3D-Konstruktion mit Pro/Engineer - Wildfire, Paul Wyndorps, Europa Lehrmittel, ISBN: 978-3-8085-8948-9

Pro/Engineer Tipps und Techniken, Wolfgang Berg, Hanser Verlag, ISBN: 3-446-22711-3 (für Fortgeschrittene)

**7.159 Course: Mechanical Design Basics II, Tutorial [T-MACH-110365]**

Responsible: Prof. Dr.-Ing. Sven Matthiesen
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101299 - Mechanical Design](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 1 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|---------------------------------|
| SS 2020 | 2146132 | Tutorials Mechanical Design Basics II | 2 SWS | Practice (Ü) | Albers, Matthiesen, Mitarbeiter |

Competence Certificate

CIW/ VT/ IP-M/ WiING/ NWT/ MATH/ MWT: For passing the prerequisite it is necessary that a design task is successfully completed as a technical hand drawing

MIT: To pass the preliminary examination, attendance at workshop sessions and a colloquium at the beginning of each workshop are required.

Prerequisites

None

Below you will find excerpts from events related to this course:

**Tutorials Mechanical Design Basics II**

2146132, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practice (Ü)

Content

Design

Dimensioning

Component connections

Bolted connection

Workload:**MIT Students:**

Presence time: 18 h

Self study: 30 h

CIW/VT/ IP-M/WiING / NWT/MATH/MWT

Presence time: 10,5 h

Self study: 37,5 h

Literature**Konstruktionselemente des Maschinenbaus - 1 und 2**

Grundlagen der Berechnung und Gestaltung von Maschinenelementen;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-22033-X

Grundlagen von Maschinenelementen für Antriebsaufgaben;

Steinhilper, Sauer, Springer Verlag, ISBN 3-540-29629-8

CAD:

3D-Konstruktion mit Pro/Engineer - Wildfire, Paul Wyndorps, Europa Lehrmittel, ISBN: 978-3-8085-8948-9

Pro/Engineer Tipps und Techniken, Wolfgang Berg, Hanser Verlag, ISBN: 3-446-22711-3 (für Fortgeschrittene)

T

7.160 Course: Metal Forming [T-MACH-105177]**Responsible:** Dr. Thomas Herlan**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|-------------------------------|-------|-------------|--------|
| SS 2020 | 2150681 | Metal Forming | 2 SWS | Lecture (V) | Herlan |

Competence Certificate

Oral Exam (20 min)

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Metal Forming2150681, SS 2020, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)**

Content

At the beginning of the lecture the basics of metal forming are briefly introduced. The focus of the lecture is on massive forming (forging, extrusion, rolling) and sheet forming (car body forming, deep drawing, stretch drawing). This includes the systematic treatment of the appropriate metal forming Machines and the corresponding tool technology. Aspects of tribology, as well as basics in material science and aspects of production planning are also discussed briefly. The plastic theory is presented to the extent necessary in order to present the numerical simulation method and the FEM computation of forming processes or tool design. The lecture will be completed by product samples from the forming technology.

The topics are as follows:

- Introduction and basics
- Hot forming
- Metal forming machines
- Tools
- Metallographic fundamentals
- Plastic theory
- Tribology
- Sheet forming
- Extrusion
- Numerical simulation

Learning Outcomes:

The students ...

- are able to reflect the basics, forming processes, tools, Machines and equipment of metal forming in an integrated and systematic way.
- are capable to illustrate the differences between the forming processes, tools, machines and equipment with concrete examples and are qualified to analyze and assess them in terms of their suitability for the particular application.
- are also able to transfer and apply the acquired knowledge to other metal forming problems.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Start: 24.04.2020

Vorlesungstermine freitags, wöchentlich.

Die konkreten Termine werden in der ersten Vorlesung bekannt gegeben und auf der Institutshomepage und ILIAS veröffentlicht.

Literature**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

T

7.161 Course: Microactuators [T-MACH-101910]

Responsible: Prof. Dr. Manfred Kohl
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|--------------------------------|-------|-------------|------|
| SS 2020 | 2142881 | Microactuators | 2 SWS | Lecture (V) | Kohl |

Competence Certificate

written exam, 60 min.

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Microactuators

2142881, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

- Basic knowledge in the material science of the actuation principles
- Layout and design optimization
- Fabrication technologies
- Selected developments
- Applications

The lecture includes amongst others the following topics:

- Microelectromechanical systems: linear actuators, microrelais, micromotors
- Medical technology and life sciences: Microvalves, micropumps, microfluidic systems
- Microrobotics: Microgrippers, polymer actuators (smart muscle)
- Information technology: Optical switches, mirror systems, read/write heads

Literature

- Folienskript "Mikroaktorik"
- D. Jendritza, Technischer Einsatz Neuer Aktoren: Grundlagen, Werkstoffe, Designregeln und Anwendungsbeispiele, Expert-Verlag, 3. Auflage, 2008
- M. Kohl, Shape Memory Microactuators, M. Kohl, Springer-Verlag Berlin, 2004
- N.TR. Nguyen, S.T. Wereley, Fundamentals and applications of Microfluidics, Artech House, Inc. 2002
- H. Zappe, Fundamentals of Micro-Optics, Cambridge University Press 2010

T

7.162 Course: Mobility and Infrastructure [T-BGU-101791]

Responsible: Prof. Dr.-Ing. Ralf Roos
Prof. Dr.-Ing. Peter Vortisch

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: [M-BGU-101067 - Mobility and Infrastructure](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 9 | Each term | 2 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-----------------------------------|
| SS 2020 | 6200404 | Spatial Planning and Planning Law | 2 SWS | Lecture (V) | Wilske |
| SS 2020 | 6200405 | Exercises to Spatial Planning and Planning Law | 1 SWS | Practice (Ü) | Wilske, Mitarbeiter/ innen |
| SS 2020 | 6200406 | Transportation Systems | 2 SWS | Lecture (V) | Vortisch |
| SS 2020 | 6200407 | Exercises to Transportation Systems | SWS | Practice (Ü) | Vortisch, Mitarbeiter/ innen |
| SS 2020 | 6200408 | Design Basics in Highway Engineering | 2 SWS | Lecture (V) | Roos, Zimmermann |
| SS 2020 | 6200409 | Exercises to Design Basics in Highway Engineering | SWS | Practice (Ü) | Plachkova-Dzhurova, Zimmermann |

Competence Certificate

written exam, 150 min.

Prerequisites

None

Recommendation

For students from the KIT-Department of Economics and Management it is recommended to take part in the exercises.

Annotation

none

T

7.163 Course: Modeling and OR-Software: Introduction [T-WIWI-106199]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101413 - Applications of Operations Research](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4,5 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|----------------------|---------------|
| SS 2020 | 2550490 | Modellieren und OR-Software: Einführung | 3 SWS | Practical course (P) | Nickel, Pomes |

Competence Certificate

The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).

The examination is held in the term of the software laboratory and the following term.

Prerequisites

None

Recommendation

Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [2550040] of the module *Operations Research*.

Annotation

Due to capacity restrictions, registration before course start is required. For further information see the webpage of the course.

The lecture is offered in every term. The planned lectures and courses for the next three years are announced online.

Below you will find excerpts from events related to this course:

V

Modellieren und OR-Software: Einführung

2550490, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, ...), the software IBM ILOG CPLEX Optimization Studio and the corresponding modeling language OPL will be discussed which can be used to solve OR problems on a computer-aided basis. Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

T

7.164 Course: Modelling and Identification [T-ETIT-100699]

Responsible: Prof. Dr.-Ing. Sören Hohmann
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [M-ETIT-101156 - Control Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

Prerequisites

none

T

7.165 Course: Nanotechnology with Clusterbeams [T-MACH-102080]**Responsible:** Dr. Jürgen Gspann**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

Competence Certificate

written examination

presence in more than 70% of the lectures

Duration: 1 h

aids: none

Prerequisites



none

T

7.166 Course: Nonlinear Optimization I [T-WIWI-102724]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)
[M-WIWI-103278 - Optimization under Uncertainty](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 4 |

| Events | | | | | |
|----------|---------|---|-------|--|-------|
| WS 20/21 | 2550111 | Nonlinear Optimization I | 2 SWS | Lecture (V) /  | Stein |
| WS 20/21 | 2550112 | Exercises Nonlinear Optimization I + II | SWS | Practice (Ü) /  | Stein |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation.

The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of *Nonlinear Optimization II* [2550113]. In this case, the duration of the written examination takes 120 minutes.

Prerequisites

The module component exam T-WIWI-103637 "Nonlinear Optimization I and II" may not be selected.

Annotation

Part I and II of the lecture are held consecutively in the *same* semester.

Below you will find excerpts from events related to this course:

V

Nonlinear Optimization I

2550111, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**7.167 Course: Nonlinear Optimization I and II [T-WIWI-103637]**

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 9 | Each winter term | 6 |

| Events | | | | | |
|----------|---------|---|-------|----------------|-------|
| WS 20/21 | 2550111 | Nonlinear Optimization I | 2 SWS | Lecture (V) / | Stein |
| WS 20/21 | 2550112 | Exercises Nonlinear Optimization I + II | SWS | Practice (Ü) / | Stein |
| WS 20/21 | 2550113 | Nonlinear Optimization II | 2 SWS | Lecture (V) / | Stein |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (120 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

Prerequisites

None.

Annotation

Part I and II of the lecture are held consecutively in the **same** semester.

Below you will find excerpts from events related to this course:

**Nonlinear Optimization I**

2550111, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *with* constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.

Literature

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

**Nonlinear Optimization II**

2550113, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Literature

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:



- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000


T

7.168 Course: Nonlinear Optimization II [T-WIWI-102725]

Responsible: Prof. Dr. Oliver Stein
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101414 - Methodical Foundations of OR](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|---|-------|--|-------|
| WS 20/21 | 2550112 | Exercises Nonlinear Optimization I + II | SWS | Practice (Ü) /  | Stein |
| WS 20/21 | 2550113 | Nonlinear Optimization II | 2 SWS | Lecture (V) /  | Stein |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation and possibly of a compulsory prerequisite.

The exam takes place in the semester of the lecture and in the following semester.

The exam can also be combined with the examination of *Nonlinear Optimization I* [2550111]. In this case, the duration of the written exam takes 120 minutes.

Prerequisites

None.

Annotation

Part I and II of the lecture are held consecutively in the same semester.

Below you will find excerpts from events related to this course:

V

Nonlinear Optimization II

2550113, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

Remark:

The treatment of optimization problems *without* constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively *in the same semester*.

Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.

Literature

O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- O. Güler, Foundations of Optimization, Springer, 2010
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer, 2000

T

7.169 Course: Novel Actuators and Sensors [T-MACH-102152]

Responsible: Prof. Dr. Manfred Kohl
Dr. Martin Sommer

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|---|-------|---|--------------|
| WS 20/21 | 2141865 | Novel actuators and sensors | 2 SWS | Lecture (V) /  | Kohl, Sommer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate
written exam, 60 minutes

Prerequisites
none

Below you will find excerpts from events related to this course:

V

Novel actuators and sensors

2141865, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Literature

- Vorlesungsskript "Neue Aktoren" und Folienskript "Sensoren"
- Donald J. Leo, Engineering Analysis of Smart Material Systems, John Wiley & Sons, Inc., 2007
- "Sensors Update", Edited by H.Baltes, W. Göpel, J. Hesse, VCH, 1996, ISBN: 3-527-29432-5
- "Multivariate Datenanalyse – Methodik und Anwendungen in der Chemie", R. Henrion, G. Henrion, Springer 1994, ISBN 3-540-58188-X

T

7.170 Course: Operative CRM [T-WIWI-102597]

Responsible: Prof. Dr. Andreas Geyer-Schulz
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101422 - Specialization in Customer Relationship Management](#)
[M-WIWI-101460 - CRM and Service Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

Competence Certificate

Written examination (60 minutes) according to §4(2), 1 SPO. The exam is considered passed if at least 50 out of a maximum of 100 possible points are achieved. The grades are graded in five steps (best grade 1.0 from 95 points). Details of the grade formation and scale will be announced in the course.

A bonus can be acquired through successful participation in the practice. If the grade of the written examination is between 4.0 and 1.3, the bonus improves the grade by one grade level (0.3 or 0.4). The exact criteria for awarding a bonus will be announced at the beginning of the course.

Prerequisites

None

Recommendation

The attendance of courses Customer Relationship Management and Analytical CRM is advised.

**7.171 Course: Optimization under Uncertainty [T-WIWI-106545]**

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101413 - Applications of Operations Research](#)
[M-WIWI-103278 - Optimization under Uncertainty](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|---|-------|----------------|--------------------|
| WS 20/21 | 2550464 | Optimierungsansätze unter Unsicherheit | SWS | Lecture (V) / | Rebennack |
| WS 20/21 | 2550465 | Übungen zu Optimierungsansätze unter Unsicherheit | SWS | Practice (Ü) / | Rebennack, Füllner |
| WS 20/21 | 2550466 | | 2 SWS | Practice (Ü) / | Rebennack, Füllner |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

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

7.172 Course: Optoelectronic Components [T-ETIT-101907]

Responsible: Prof. Dr. Wolfgang Freude**Organisation:** KIT Department of Electrical Engineering and Information Technology**Part of:** [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|--------|
| SS 2020 | 2309486 | Optoelectronic Components | 2 SWS | Lecture (V) | Freude |
| SS 2020 | 2309487 | Optoelectronic Components (Tutorial) | 1 SWS | Practice (Ü) | Freude |

Prerequisites

none

**7.173 Course: Personnel Policies and Labor Market Institutions [T-WIWI-102908]**

Responsible: Prof. Dr. Petra Nieken
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101513 - Human Resources and Organizations](#)
[M-WIWI-101668 - Economic Policy I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|---------------------|
| SS 2020 | 2573001 | Personnel Policies and Labor Market Institutions | 2 SWS | Lecture (V) | Nieken |
| SS 2020 | 2573002 | Übungen zu Personalpolitik und Arbeitsmarktinstitutionen | 1 SWS | Practice (Ü) | Nieken, Mitarbeiter |

Competence Certificate

The assessment of this course is a written examination of 1 hour. The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

In case of a small number of registrations, we might offer an oral exam instead of a written exam.

Prerequisites

None

Recommendation

Completion of module Business Administration is recommended.

Basic knowledge of microeconomics, game theory, and statistics is recommended.

Below you will find excerpts from events related to this course:

**Personnel Policies and Labor Market Institutions**

2573001, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The students acquire knowledge about the process and the strategic aspects of collective bargaining about wages. They analyze selected aspects of corporate governance and co-determination in Germany. The lecture also addresses questions of personnel politics and labor market discrimination. Microeconomic and behavioral approaches as well as empirical data is used and evaluated critically.

Aim

The student

- understands the process and role of agents in collective wage bargaining.
- analyzes strategic decisions in the context of corporate governance.
- understands the concept of co-determination in Germany.
- challenges statements that evaluate certain personnel politics.

Workload

The total workload for this course is approximately 135 hours.

Lecture 32 hours

Preparation of lecture 52 hours

Exam preparation 51 hours

Literature

Arbeitsmarktökonomik, W. Franz, Springer, 2013

T

7.174 Course: PH APL-ING-TL01 [T-WIWI-106291]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Once | 1 |

T

7.175 Course: PH APL-ING-TL02 [T-WIWI-106292]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Once | 1 |

T

7.176 Course: PH APL-ING-TL03 [T-WIWI-106293]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Once | 1 |

T

7.177 Course: PH APL-ING-TL04 ub [T-WIWI-106294]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------|---------|
| Completed coursework | 0 | Once | 1 |

T

7.178 Course: PH APL-ING-TL05 ub [T-WIWI-106295]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------|---------|
| Completed coursework | 0 | Once | 1 |

T

7.179 Course: PH APL-ING-TL06 ub [T-WIWI-106296]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------|---------|
| Completed coursework | 0 | Once | 1 |

T


7.180 Course: PH APL-ING-TL07 [T-WIWI-108384]**Organisation:** University**Part of:** [M-WIWI-101404 - Extracurricular Module in Engineering](#)


| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Once | 1 |

T

7.181 Course: Physical Basics of Laser Technology [T-MACH-102102]**Responsible:** Dr.-Ing. Johannes Schneider**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 5 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|---|-------|---|-----------|
| WS 20/21 | 2181612 | Physical basics of laser technology | 3 SWS | Lecture / Practice (VÜ) /  | Schneider |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**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]

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 technology2181612, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)Lecture / Practice (VÜ)
Online

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
- safety aspects

The lecture is complemented by a tutorial.

The student

- can explain the principles of light generation, the conditions for light amplification as well as the basic structure and function of different laser sources.
- can describe the influence of laser, material and process parameters for the most important methods of laser-based materials processing and choose laser sources suitable for specific applications.
- can illustrate the possible applications of laser sources in measurement and medicine technology
- can explain the requirements for safe handling of laser radiation and for the design of safe laser systems.

Basic knowledge of physics, chemistry and material science is assumed.

regular attendance: 33,5 hours

self-study: 116,5 hours

The assessment consists of an oral exam (ca. 30 min) taking place at the agreed date (according to Section 4(2), 2 of the examination regulation). The re-examination is offered upon agreement.

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.

Organizational issues

Termine für die Übung werden in der Vorlesung bekannt gegeben!

Literature

F. K. Kneubühl, M. W. Sigrist: Laser, 2008, Vieweg+Teubner

T. Graf: Laser - Grundlagen der Laserstrahlquellen, 2009, Vieweg-Teubner Verlag

R. Poprawe: Lasertechnik für die Fertigung, 2005, Springer

H. Hügel, T. Graf: Laser in der Fertigung, 2009, Vieweg+Teubner

J. Eichler, H.-J. Eichler: Laser - Bauformen, Strahlführung, Anwendungen, 2006, Springer

W. T. Silfvast: Laser Fundamentals, 2008, Cambridge University Press

W. M. Steen: Laser Material Processing, 2010, Springer

T

7.182 Course: Physics for Engineers [T-MACH-100530]

Responsible: Prof. Dr. Martin Dienwiebel
 Prof. Dr. Peter Gumbsch
 apl. Prof. Dr. Alexander Nesterov-Müller
 Dr. Daniel Weygand

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---------------------------------------|-------|-------------|---|
| SS 2020 | 2142890 | Physics for Engineers | 2 SWS | Lecture (V) | Weygand, Dienwiebel, Nesterov-Müller, Gumbsch |

Competence Certificate
 written exam 90 min

Prerequisites
 none

Below you will find excerpts from events related to this course:

V

Physics for Engineers

2142890, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

1) Foundations of solid state physics

- Wave particle dualism
- Tunnelling
- Schrödinger equation
- H-atom

2) Electrical conductivity of solids

- solid state: periodic potentials
- Pauli Principle
- band structure
- metals, semiconductors and isolators
- p-n junction / diode

3) Optics

- quantum mechanical principles of the laser
- linear optics
- non-linear optics

Exercises (2142891, 2 SWS) are used for complementing and deepening the contents of the lecture as well as for answering more extensive questions raised by the students and for testing progress in learning of the topics.

The student

- has the basic understanding of the physical foundations to explain the relationship between the quantum mechanical principles and the optical as well as electrical properties of materials
- can describe the fundamental experiments, which allow the illustration of these principles

regular attendance: 22,5 hours (lecture) and 22,5 hours (exercises 2142891)

self-study: 97,5 hours and 49 hours (exercises 2142891)

The assessment consists of a written exam (90 minutes) (following §4(2), 1 of the examination regulation).

Literature

- Tipler und Mosca: Physik für Wissenschaftler und Ingenieure, Elsevier, 2004
- Haken und Wolf: Atom- und Quantenphysik. Einführung in die experimentellen und theoretischen Grundlagen, 7. Aufl., Springer, 2000
- Harris, Moderne Physik, Pearson Verlag, 2013

**7.183 Course: Platform Economy [T-WIWI-109936]**

Responsible: Dr. Verena Dorner
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101421 - Supply Chain Management](#)
[M-WIWI-101434 - eBusiness and Service Management](#)
[M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)
[M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 3 |

| Events | | | | | |
|----------|---------|---|-------|----------------|-----------------|
| WS 20/21 | 2540468 | Platform Economy | 2 SWS | Lecture (V) / | Dann, Weinhardt |
| WS 20/21 | 2540469 | Übung zu Platform Economy | SWS | Practice (Ü) / | Dann, Richter |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. Details of the grades will be announced at the beginning of the course.

Prerequisites

see below

Recommendation

None

Below you will find excerpts from events related to this course:

**Platform Economy**

2540468, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Literature

- Bundesministerium für Wirtschaft und Energie (2017). „Kompetenzen für eine digitale Souveränität“ (abrufbar unter <https://www.bmwi.de/Redaktion/DE/Publikationen/Studien/kompetenzen-fuer-eine-digitale-souveraenitaet.html>)
- Bundesministerium für Wirtschaft und Energie (2017). „Weißbuch Digitale Plattformen.“ (abrufbar unter https://www.bmwi.de/Redaktion/DE/Publikationen/Digitale-Welt/weissbuch-digitale-plattformen.pdf?__blob=publicationFile&v=8)
- Chuen, D.L.K., ed. 2015. “Handbook of digital currency: Bitcoin, innovation, financial instruments, and big data,” Academic Press.
- Easley, D., and Kleinberg, J. 2010. “Network Effects,” in Networks, Crowds, and Markets: Reasoning about a Highly Connected World, Cambridge University Press, pp. 509–542.
- Eisenmann, T., Parker, G., and Van Alstyne, M. W. 2006. “Strategies for two-sided markets,” Harvard Business Review 84(10), pp. 1–11.
- Gassmann, O., Frankenberger, K., and Csik, M. 2013. Geschäftsmodelle entwickeln: 55 innovative Konzepte mit dem St. Galler Business Model Navigator, Hanser.
- Wattenhofer, R. 2016. “The science of the blockchain.” CreateSpace Independent Publishing Platform.
- Roth, A. 2002. “The Economist as Engineer: Game Theory, Experimental Economics and Computation as Tools for Design Economics,” Econometrica 70(4): 1341-1378, 2002.
- Weinhardt, C., Holtmann, C., Neumann, D., Market Engineering. Wirtschaftsinformatik, 2003.
- Wolfstetter, E., 1999. “Topics in Microeconomics - Industrial Organization, Auctions, and Incentives,” Cambridge, Cambridge University Press.
- Teubner, T., and Hawlitschek, F. (in press). “The economics of P2P online sharing,” in The Sharing Economy: Possibilities, Challenges, and the way forward, Praeger Publishing.

**7.184 Course: PLM for Product Development in Mechatronics [T-MACH-102181]****Responsible:** Prof. Dr.-Ing. Martin Eigner**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|----------|---------|---|-----|---------------|--------|
| SS 2020 | 2122376 | PLM for product development in mechatronics | SWS | Lecture (V) | Eigner |
| WS 20/21 | 2122376 | PLM for product development in mechatronics | SWS | Lecture (V) / | Eigner |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Oral examination 20 min.

Prerequisites

none

Below you will find excerpts from events related to this course:

**PLM for product development in mechatronics**2122376, SS 2020, SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Students are able to

- compare product data management and product lifecycle management.
- describe the components and core functions of a PLM solution
- explain trends from research and practice in the field of PLM form mechatronic product development

Organizational issues

Blockveranstaltung

Literature

Vorlesungsfolien / lecture slides

**PLM for product development in mechatronics**2122376, WS 20/21, SWS, Language: German, [Open in study portal](#)Lecture (V)
On-Site**Content**

Students are able to

- compare product data management and product lifecycle management.
- describe the components and core functions of a PLM solution
- explain trends from research and practice in the field of PLM form mechatronic product development

Organizational issues

Blockveranstaltung, Zeit und Ort siehe Homepage oder ILIAS zur Lehrveranstaltung.


Literature





Vorlesungsfolien / lecture slides

T

7.185 Course: PLM-CAD Workshop [T-MACH-102153]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4 | Each term | 2 |

| Events | | | | | |
|----------|---------|----------------------------------|-------|---|-------------------------|
| SS 2020 | 2121357 | PLM-CAD Workshop | 4 SWS | Project (PRO) | Ovtcharova, Mitarbeiter |
| WS 20/21 | 2121357 | PLM-CAD Workshop | 4 SWS | Project (PRO) /  | Ovtcharova, Mitarbeiter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Alternative exam assessment (graded)

Prerequisites

None

Annotation

Number of participants is limited, compulsory attendance

Below you will find excerpts from events related to this course:

V

PLM-CAD Workshop2121357, SS 2020, 4 SWS, Language: German, [Open in study portal](#)**Project (PRO)****Content**

The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.

Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

Organizational issues

Siehe Homepage zur Lehrveranstaltung

Literature

Workshop-Unterlagen / workshop materials

V

PLM-CAD Workshop2121357, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)**Project (PRO)
Blended (On-Site/Online)****Content**

The aim of the workshop is to demonstrate the benefits of collaborative product development using PLM methods and to emphasize their added value compared to classical CAD development.

Students learn how to develop and produce a prototype with the help of modern PLM and CAx systems.

Organizational issues

Termine voraussichtlich Vormittags 09:45 - 13:00 . Weitere Informationen siehe ILIAS.

Literature

Workshop-Unterlagen / workshop materials

T


7.186 Course: Polymer Engineering I [T-MACH-102137]

Responsible: Prof. Dr.-Ing. Peter Elsner
Dr.-Ing. Wilfried Liebig

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---------------------------------------|-------|---|----------------|
| WS 20/21 | 2173590 | Polymer Engineering I | 2 SWS | Lecture (V) /  | Elsner, Liebig |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

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 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

1. Economical aspects of polymers
2. Introduction of mechanical, chemical and electrical properties
3. Processing of polymers (introduction)
4. Material science of polymers
5. Synthesis

learning objectives:

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, to equip the students with knowledge and technical skills, and to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- are able to describe and classify polymers based on the fundamental synthesis processing techniques
- can find practical applications for state-of-the-art polymers and manufacturing technologies
- are able to apply the processing techniques, the application of polymers and polymer composites regarding to the basic principles of material science
- can describe the special mechanical, chemical and electrical properties of polymers and correlate these properties to the chemical bindings.
- can define application areas and the limitation in the use of polymers

Organizational issues

Veranstaltung findet synchron statt, Do 15.45Uhr-17.15Uhr, weitere Informationen siehe ILIAS

Literature

Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.

**7.187 Course: Polymer Engineering II [T-MACH-102138]**

Responsible: Prof. Dr.-Ing. Peter Elsner
Dr.-Ing. Wilfried Liebig

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|----------------|
| SS 2020 | 2174596 | Polymer Engineering II | 2 SWS | Lecture (V) | Elsner, Liebig |

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:

**Polymer Engineering II**

2174596, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

learning objectives:

The field of Polymer Engineering includes synthesis, material science, processing, construction, design, tool engineering, production technology, surface engineering and recycling. The aim is, that the students gather knowledge and technical skills to use the material "polymer" meeting its requirements in an economical and ecological way.

The students

- can describe and classify different processing techniques and can exemplify mould design principles based on technical parts.
- know about practical applications and processing of polymer parts
- are able to design polymer parts according to given restrictions
- can choose appropriate polymers based on the technical requirements
- can decide how to use polymers regarding the production, economical and ecological requirements

requirements:

Polymerengineering I

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).

Organizational issues

Die ersten beiden Vorlesungen finden in dem im Vorlesungsverzeichnis ausgewiesenen Raum am KIT statt. Die meisten darauffolgenden Vorlesungen finden jeweils von 16:20-19:20 am ICT in Berghausen statt. Nähere Informationen dazu in den beiden ersten Vorlesungen.

Literature

Literaturhinweise, Unterlagen und Teilmanuskript werden in der Vorlesung ausgegeben.


Recommended literature and selected official lecture notes are provided in the lecture.





T

7.188 Course: Power Generation [T-ETIT-101924]

Responsible: Dr.-Ing. Bernd Hoferer
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [M-ETIT-101165 - Energy Generation and Network Components](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|----------------------------------|-------|---|---------|
| WS 20/21 | 2307356 | Power Generation | 2 SWS | Lecture (V) /  | Hoferer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Prerequisites



none





T

7.189 Course: Power Network [T-ETIT-100830]

Responsible: Prof. Dr.-Ing. Thomas Leibfried
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: [M-ETIT-102379 - Power Network](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|------------------------------------|
| WS 20/21 | 2307371 | Power Network | 2 SWS | Lecture (V) /  | Leibfried |
| WS 20/21 | 2307373 | Tutorial for 2307371 Power Network | 2 SWS | Practice (Ü) /  | Hirsching, Leibfried, Geis-Schroer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.190 Course: Practical Seminar Interaction [T-WIWI-109935]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-104911 - Information Systems & Digital Business: Interaction](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4,5 | Each term | 2 |

| Events | | | | | |
|----------|---------|--|-------|-------------|--------|
| WS 20/21 | 2540555 | Practical Seminar: Digital Services (Ba) | 3 SWS | Lecture (V) | Mädche |

Competence Certificate

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

Prerequisites

None.

T

7.191 Course: Practical Seminar Platforms [T-WIWI-109937]

Responsible: Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-104912 - Information Systems & Digital Business: Platforms](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4,5 | Each term | 2 |

Competence Certificate

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

Prerequisites

None.

T

7.192 Course: Practical Seminar Servitization [T-WIWI-109939]

Responsible: Prof. Dr. Alexander Mädche
Prof. Dr. Gerhard Satzger

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-104913 - Information Systems & Digital Business: Servitization](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4,5 | Each term | 1 |

Competence Certificate

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class. Please take into account that, beside the written documentation, also a practical component (e.g. implementation of a prototype) is part of the course. Please examine the course description for the particular tasks. The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class). In the winter terms, the course is only offered as a seminar.

Prerequisites

None.

T

7.193 Course: Practical Seminar: Digital Services [T-WIWI-110888]

Responsible: Prof. Dr. Gerhard Satzger
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-102752 - Fundamentals of Digital Service Systems](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4,5 | Each summer term | 1 |

| Events | | | | | |
|----------|---------|--|-------|-------------|--------|
| WS 20/21 | 2540555 | Practical Seminar: Digital Services (Ba) | 3 SWS | Lecture (V) | Mädche |

Competence Certificate

The assessment consists of a seminar paper, a presentation of the results and the contribution to the discussion (according to §4(2), 3 of the examination regulation). The final grade is based on the evaluation of each component (seminar paper, oral presentation, and active participation).

Prerequisites

None

Recommendation

None

Annotation

The current range of seminar topics is announced on the KSRI website www.ksri.kit.edu.

T

7.194 Course: Practical Training in Basics of Microsystem Technology [T-MACH-102164]

Responsible: Dr. Arndt Last

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-------|----------------------|------|
| SS 2020 | 2143875 | Introduction to Microsystem Technology - Practical Course | 2 SWS | Practical course (P) | Last |
| SS 2020 | 2143877 | Introduction to Microsystem Technology - Practical Course | 2 SWS | Practical course (P) | Last |
| WS 20/21 | 2143875 | Introduction to Microsystem Technology - Practical Course | 2 SWS | Practical course (P) | Last |
| WS 20/21 | 2143877 | Introduction to Microsystem Technology - Practical Course | 2 SWS | Practical course (P) | Last |

Competence Certificate

The assessment consists of a written exam

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Introduction to Microsystem Technology - Practical Course

2143875, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

In the practical training includes nine experiments:

1. Hot embossing of plastics micro structures
2. Micro electroforming
3. Mikro optics: "LIGA-micro spectrometer"
4. UV-lithography
5. Optical waveguides
6. Capillary electrophoresis on a chip
7. SAW gas sensor
8. Metrology
9. Atomic force microscopy

Each student takes part in only five experiments.

The experiments are carried out at real workstations at the IMT and coached by IMT-staff.

Organizational issues

Das Praktikum findet in den Laboren des IMT am CN statt. Treffpunkt: Bau 307, Raum 322.

Teilnahmeanfragen an Frau Nowotny, marie.nowotny@kit.edu

Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997

Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

V

Introduction to Microsystem Technology - Practical Course

2143877, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

In the practical training includes nine experiments:

1. Hot embossing of plastics micro structures
2. Micro electroforming
3. Mikro optics: "LIGA-micro spectrometer"
4. UV-lithography
5. Optical waveguides
6. Capillary electrophoresis on a chip
7. SAW gas sensor
8. Metrology
9. Atomic force microscopy

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Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997

Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**

2143875, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

See homepage: www.imt.kit.edu/lectures.php

Date: during the semester break

Place: IMT Laboratories, North Campus, Building 307

Practical course date in the second full week of September, respectively in the week after Ash Wednesday. The exam takes place in the following week.

Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997

Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

**Introduction to Microsystem Technology - Practical Course**

2143877, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)

Content

See homepage: www.imt.kit.edu/lectures.php

Date: during the semester break

Place: IMT Laboratories, North Campus, Building 307

Practical course date in the second full week of September, respectively in the week after Ash Wednesday. The exam takes place in the following week.

Literature

Menz, W., Mohr, J.: Mikrosystemtechnik für Ingenieure, VCH-Verlag, Weinheim, 1997

Unterlagen zum Praktikum zur Vorlesung 'Grundlagen der Mikrosystemtechnik'

T

7.195 Course: Problem Solving, Communication and Leadership [T-WIWI-102871]

Responsible: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101425 - Strategy and Organization](#)
[M-WIWI-101513 - Human Resources and Organizations](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 2 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-----------|
| SS 2020 | 2577910 | Problem solving, communication and leadership | 1 SWS | Lecture (V) | Lindstädt |

Competence Certificate

The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Problem solving, communication and leadership

2577910, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the prerequisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

Learning Objectives:

After passing this course students are able to

- structure problem solving processes.
- apply the principles of focused communication based on charts and presentations.
- understand leadership in the context of situation and personality.

Recommendations:

None.

Workload:

The total workload for this course is approximately 60 hours. For further information see German version.

Assessment:

The assessment consists of a written exam (30 minutes) (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Organizational issues

Blockveranstaltung, Termine werden bekannt gegeben

Literature**Verpflichtende Literatur:**

Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

Ergänzende Literatur:

- Hungenberg, Harlad: Problemlösung und Kommunikation, 3. Aufl. München 2010
- Zelazny, Gene; Delker, Christel: Wie aus Zahlen Bilder werden, 6. Aufl. Wiesbaden 2008
- Minto, Barbara: Das Prinzip der Pyramide: Ideen klar, verständlich und erfolgreich kommunizieren. 2005

T

7.196 Course: Procedures of Remote Sensing [T-BGU-103542]

Responsible: Dr.-Ing. Uwe Weidner
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Version |
|------------------|---------|---------|
| Oral examination | 3 | 2 |

T

7.197 Course: Procedures of Remote Sensing, Prerequisite [T-BGU-101638]**Responsible:** Dr.-Ing. Uwe Weidner**Organisation:** KIT Department of Civil Engineering, Geo- and Environmental Sciences**Part of:** [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 1 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|---------|
| SS 2020 | 6020244 | Fernerkundungsverfahren, Übung | 1 SWS | Practice (Ü) | Weidner |

Prerequisites

None

Recommendation

None

Annotation

None

T


7.198 Course: Process Fundamentals by the Example of Food Production [T-CIWVT-106058]





Responsible: Dr. Volker Gaukel

Organisation: KIT Department of Chemical and Process Engineering

Part of: [M-WIWI-101839 - Additional Fundamentals of Engineering](#)

| Type | Credits | Version |
|---------------------|---------|---------|
| Written examination | 3 | 1 |

| Events | | | | | |
|----------|-------|---|-------|---|--------|
| WS 20/21 | 22213 | Verfahrenstechnische Grundlagen am Beispiel der Lebensmittelverarbeitung (für LmCh, WiWi) | 2 SWS | Lecture (V) /  | Gaukel |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Prerequisites

none

T


7.199 Course: Product- and Production-Concepts for Modern Automobiles [T-MACH-110318]





Responsible: Dr. Stefan Kienzle
Dr. Dieter Steegmüller

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|----------------------|
| WS 20/21 | 2149670 | Product- and Production-Concepts for modern Automobiles | 2 SWS | Lecture (V) /  | Steegmüller, Kienzle |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Oral Exam (20 min)

Prerequisites

T-MACH-105166 - Materials and Processes for Body Lightweight Construction in the Automotive Industry must not have been started.

Below you will find excerpts from events related to this course:

V

Product- and Production-Concepts for modern Automobiles

2149670, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

The lecture illuminates the practical challenges of modern automotive engineering. As former leaders of the automotive industry, the lecturers refer to current aspects of automotive product development and production.

The aim is to provide students with an overview of technological trends in the automotive industry. In this context, the course also focuses on changes in requirements due to new vehicle concepts, which may be caused by increased demands for individualisation, digitisation and sustainability. The challenges that arise in this context will be examined from both a production technology and product development perspective and will be illustrated with practical examples thanks to the many years of industrial experience of both lecturers.

The topics covered are:

- General conditions for vehicle and body development
- Integration of new drive technologies
- Functional requirements (crash safety etc.), also for electric vehicles
- Development Process at the Interface Product & Production, CAE/Simulation
- Energy storage and supply infrastructure
- Aluminium and lightweight steel construction
- FRP and hybrid parts
- Battery, fuel cell and electric motor production
- Joining technology in modern car bodies
- Modern factories and production processes, Industry 4.0.

Learning Outcomes:

The students ...

- are able to name the presented general conditions of vehicle development and are able to discuss their influences on the final product using practical examples.
- are able to name the various lightweight approaches and identify possible areas of application.
- are able to identify the different production processes for manufacturing lightweight structures and explain their functions.
- are able to perform a process selection based on the methods and their characteristics.

Workload:

regular attendance: 25 hours

self-study: 95 hours

Organizational issues

Termine werden über Ilias bekannt gegeben.

Bei der Vorlesung handelt es sich um eine Blockveranstaltung. Eine Anmeldung über Ilias ist erforderlich.

The lecture is a block course. An application in Ilias is mandatory.

Literature**Medien:**

Skript zur Veranstaltung wird über (<https://ilias.studium.kit.edu/>) bereitgestellt.

Media:





Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>).

T

7.200 Course: Product Lifecycle Management [T-MACH-105147]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|---|------------|
| WS 20/21 | 2121350 | Product Lifecycle Management | 2 SWS | Lecture (V) /  | Ovtcharova |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Written examination 90 min.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Product Lifecycle Management2121350, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)
Online****Content**

The course includes:

- Basics for product data management and data exchange
- IT system solutions for Product Lifecycle Management (PLM)
- Economic viability analysis and implementation problems
- Illustrative scenario for PLM using the example of the institute's own I4.0Lab

After successful attendance of the course, students can:

- identify the challenges of data management and exchange and describe solution concepts for these challenges.
- clarify the management concept PLM and its goals and highlight the economic benefits.
- explain the processes required to support the product life cycle and describe the most important business software systems (PDM, ERP, ...) and their functions.

Literature

Vorlesungsfolien.

V. Arnold et al: Product Lifecycle Management beherrschen, Springer-Verlag, Heidelberg, 2005.

J. Stark: Product Lifecycle Management, 21st Century Paradigm for Product Realisation, Springer-Verlag, London, 2006.

A. W. Scheer et al: Prozessorientiertes Product Lifecycle Management, Springer-Verlag, Berlin, 2006.

J. Schöttner: Produktdatenmanagement in der Fertigungsindustrie, Hanser-Verlag, München, 1999.

M.Eigner, R. Stelzer: Produktdaten Management-Systeme, Springer-Verlag, Berlin, 2001.

G. Hartmann: Product Lifecycle Management with SAP, Galileo press, 2007.

K. Obermann: CAD/CAM/PLM-Handbuch, 2004.

T

7.201 Course: Product, Process and Resource Integration in the Automotive Industry [T-MACH-102155]

Responsible: Prof. Dr.-Ing. Sama Mbang

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|--|-------|-------------|-------|
| SS 2020 | 2123364 | Product, Process and Resource Integration in the Automotive Industry | 2 SWS | Lecture (V) | Mbang |

Competence Certificate

Oral examination 20 min.

Prerequisites

None

Annotation

Limited number of participants.

Below you will find excerpts from events related to this course:

V

Product, Process and Resource Integration in the Automotive Industry

2123364, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

- Overview of product development in the automotive sector (process- and work cycle, IT-Systems)
- Integrated product models in the automotive industry (product, process and resource)
- New CAx modeling methods (intelligent feature technology, templates & functional modeling)
- Automation and knowledge-based mechanism for product design and production planning
- Product development in accordance with defined process and requirement (3D-master principle, tolerance models)
- Concurrent Engineering, shared working
- Enhanced concepts: the digital and virtual factory (application of virtual technologies and methods in the product development)

Organizational issues

Blockveranstaltung

Literature

Vorlesungsfolien

T

7.202 Course: Production Economics and Sustainability [T-WIWI-102820]

Responsible: Prof. Dr. Frank Schultmann
Dr.-Ing. Rebekka Volk

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101437 - Industrial Production I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|------|
| WS 20/21 | 2581960 | Production Economics and Sustainability | 2 SWS | Lecture (V) /  | Volk |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of an oral (30 minutes) or a written (60 minutes) exam (following §4(2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Below you will find excerpts from events related to this course:

V

Production Economics and Sustainability

2581960, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.

Topics:

- regulations related to materials and substances
- raw materials, reserves and their availabilities/lifetimes
- material and substance flow analysis (MFA/SFA)
- material related ecoprofiles, e.g. Carbon Footprint
- LCA
- resource efficiency
- emission abatement
- waste management and closed-loop recycling
- raw material oriented production systems
- environmental management (EMAS, ISO 14001, Ecoprofit), eco-controlling

Literature

wird in der Veranstaltung bekannt gegeben

T

7.203 Course: Production Technology for E-Mobility [T-MACH-110984]

Responsible: Prof. Dr.-Ing. Jürgen Fleischer
Janna Hofmann

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|--------------------|
| SS 2020 | 2150605 | Production Technology for E-Mobility | 2 SWS | Lecture (V) | Fleischer, Hofmann |

Competence Certificate

Oral Exam 20 min

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Production Technology for E-Mobility

2150605, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

In the lecture Production Engineering for Electromobility the students should be enabled to design, select and develop production processes for the production of the components of an electric drive train (electric motor, battery cells, fuel cells) by using research-oriented teaching.

Learning Outcomes:

The students are able to:

- describe the structure and function of a fuel cell, an electric traction drive and a battery system.
- reproduce the process chains for the production of the components fuel cell, battery and electric traction drive.
- apply methodical tools to solve problems along the process chain.
- derive the challenges in the production of electric drives for electric mobility.
- describe the factors influencing the individual process steps on each other using the process chain of Li-ion battery cells.
- enumerate or describe the necessary process parameters to counteract the influencing factors of the process steps in Li-ion battery cell production.
- apply methodical tools to solve problems along the process chain for the production of Li-ion battery cells.
- derive the challenge of mounting and dismounting battery modules.
- derive the challenges in the production of fuel cells for use in mobility.

Workload:

regular attendance: 42 hours

self-study: 78 hours

Organizational issues

Die Lehrveranstaltung wird erstmalig im Sommersemester 2021 angeboten.

Literature

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt.

Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

T

7.204 Course: Project in Applied Remote Sensing [T-BGU-101814]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Version |
|----------------------|---------|---------|
| Completed coursework | 1 | 1 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-------------------|
| SS 2020 | 6020245 | Projektübung angewandte Fernerkundung | 2 SWS | Practice (Ü) | Assistenten, Hinz |

T


7.205 Course: Project Internship Additive Manufacturing: Development and Production of an Additive Component [T-MACH-110960]





Responsible: Dr.-Ing. Frederik Zanger

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|-------------------|
| WS 20/21 | 2149700 | Project Internship Additive Manufacturing: Development and Production of an Additive Component | 2 SWS | Practical course (P) /  | Zanger, Lubkowitz |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative test achievement (graded):

- Milestone based presentation of the results in presentation form (10 min) and submitting of the presentation file with weighting 30%
- Oral exam (15 min) with weighting 40%
- Project work with weighting 30%

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Project Internship Additive Manufacturing: Development and Production of an Additive Component

2149700, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Practical course (P)
On-Site

Content

The lecture "Project Internship Additive Manufacturing: Development and Production of an Additive Component" combines the basics of metallic laser powder bed fusion (LPBF) with a development project in cooperation with an industrial company. The students learn the basics of the following topics in the project-related lecture:

- Influence of different process variables on the component quality of parts produced in the LPBF process
- Preparation and simulation of the LPBF process
- Production of additive metallic components
- Process monitoring and quality assurance in additive manufacturing
- Topology optimization
- CAM for subtractive rework

The topics addressed in the course will be applied practically in various workshops on the individual topics and transferred to the developmental task in self-study.

Finally, the results of the elaborations are produced additively and post-processed subtractively.

Learning Outcomes:

The students ...

- are able to describe the properties and applications of the additive manufacturing processes laser powder bed fusion (LPBF) and lithography assisted ceramic manufacturing (LCM).
- are able to select the appropriate manufacturing process for a technical application.
- are able to describe and implement the creation of a product along the entire additive process chain (CAD, simulation, work preparation, CAM) from the idea to the production.
- are able to discuss the development process for components that are optimized for additive manufacturing.
- are able to perform topology optimization.
- are able to simulate the additive process, compensate for process-related distortions and determine the ideal alignment on the building platform.
- are able to create necessary support structures for the additive process and to derive a building order file.
- are able to create a CAM model for the subtractive rework process of additive parts.

Workload:

regular attendance: 12 hours

self-study: 108 hours

Organizational issues

Termine werden über Ilias bekannt gegeben.

Bei der Vorlesung handelt es sich um eine Blockveranstaltung.

Eine Anmeldung über Ilias ist erforderlich.

Dates will be announced via Ilias.

The lecture is a block event.

A registration via Ilias is required.

Literature

Skript zur Veranstaltung wird über Ilias (<https://ilias.studium.kit.edu/>) bereitgestellt


Lecture notes will be provided in Ilias (<https://ilias.studium.kit.edu/>)

T

7.206 Course: Project Management [T-BGU-101675]

Responsible: Prof. Dr.-Ing. Shervin Haghsheno
Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences
Part of: [M-BGU-101004 - Fundamentals of Construction](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|-----------------------------------|-------|---|----------------------|
| WS 20/21 | 6200106 | Projektmanagement | 2 SWS | Lecture / Practice (VÜ) /  | Haghsheno, Schneider |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

written exam with 60 minutes

Prerequisites

None

Recommendation

None

Annotation

None

T

7.207 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 - Handling Characteristics of Motor Vehicles](#)
[M-MACH-101265 - Vehicle Development](#)
[M-MACH-101266 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------|---------|
| Oral examination | 4,5 | Each term | 1 |

| Events | | | | | |
|----------|---------|--|-------|-------------|-------------------------|
| SS 2020 | 2115817 | Project Workshop: Automotive Engineering | 3 SWS | Lecture (V) | Gauterin, Gießler, Frey |
| WS 20/21 | 2115817 | Project Workshop: Automotive Engineering | 3 SWS | Lecture (V) | Gauterin, Gießler, Frey |

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 Engineering2115817, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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.

Learning Objectives:

The students are familiar with typical industrial development processes and working style. They are able to apply knowledge gained at the university to a practical task. They are able to analyze and to judge complex relations. They are ready to work self-dependently, to apply different development methods and to work on approaches to solve a problem, to develop practice-oriented products or processes.

Organizational issues

Begrenzte Teilnehmerzahl mit Auswahlverfahren, die Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.

Raum und Termine: s. Aushang

Literature

Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.

**Project Workshop: Automotive Engineering**

2115817, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)**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.

Learning Objectives:

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.

Organizational issues

Begrenzte Teilnehmerzahl mit Auswahlverfahren, in deutscher Sprache. Bewerbungen sind am Ende des vorhergehenden Semesters einzureichen.

Termin und Raum: siehe Institutshomepage.

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.

Literature

Steinle, Claus; Bruch, Heike; Lawa, Dieter (Hrsg.), Projektmanagement, Instrument moderner Innovation, FAZ Verlag, Frankfurt a. M., 2001, ISBN 978-3929368277

Skripte werden beim Start-up Meeting ausgegeben.


The scripts will be supplied in the start-up meeting.





T

7.208 Course: Public Law I & II [T-INFO-110300]

Responsible: Dr. Johannes Eichenhofer
Organisation: KIT Department of Informatics
Part of: [M-INFO-105084 - Public and Civil Law](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each summer term | 1 |

| Events | | | | | |
|----------|-------|---|-------|---|-------------|
| SS 2020 | 24520 | Öffentliches Recht II - Öffentliches Wirtschaftsrecht | 2 SWS | Lecture (V) | Eichenhofer |
| WS 20/21 | 24016 | Öffentliches Recht I - Grundlagen | 2 SWS | Lecture (V) /  | Eichenhofer |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

T

7.209 Course: Public Revenues [T-WIWI-102739]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101403 - Public Finance](#)
[M-WIWI-101499 - Applied Microeconomics](#)
[M-WIWI-101668 - Economic Policy I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|--------|
| SS 2020 | 2560120 | Public Revenues | 2 SWS | Lecture (V) | Wigger |
| SS 2020 | 2560121 | Übung zu Öffentliche Einnahmen | 1 SWS | Practice (Ü) | Wigger |

Competence Certificate

The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Prerequisites

None

Recommendation

Basic knowledge of Public Finance is required.

Below you will find excerpts from events related to this course:

V

Public Revenues

2560120, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The *Public Revenues* lecture is concerned with the theory and policy of taxation and public dept. In the first chapter, fundamental concepts of taxation theory are introduced, whereas the second chapter deals with key elements of the German taxation system. The allocative and distributive effects of different taxation types are examined in chapter three and four. Chapter five integrates both allocative and distributive components in order to derive a theory of optimal taxation. The core of the sixth chapter is represented by international aspects of taxation. The debt part begins with a description of the extent and structure of public dept in chapter seven. In the following chapter, macroeconomic theories of national dept are evolved, while chapter nine is concerned with its long term consequences when employed as a regular instrument of budgeting. Finally, the tenth chapter deals with constitutional limits to public debt-incurring.

Learning goals:

See German version.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature**Literatur:**

- Homburg, S.(2000): *Allgemeine Steuerlehre*, Vahlen
- Rosen, H.S.(1995): *Public Finance*; 4. Aufl., Irwin
- Wellisch, D.(2000): *Finanzwissenschaft I und Finanzwissenschaft III*, Vahlen
- Wigger, B. U.(2006): *Grundzüge der Finanzwissenschaft*; 2. Aufl., Springer

T

7.210 Course: Public Sector Finance [T-WIWI-109590]

Responsible: Prof. Dr. Berthold Wigger
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101403 - Public Finance](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|---------------|--------------|
| WS 20/21 | 2560136 | | 3 SWS | Lecture (V) / | Wigger, Groh |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (60 min.).

Prerequisites

T-WIWI-107763 "Municipal Finance" must not be selected.

Annotation

Previous title until winter semester 2018/19 "Municipal Finance".

Below you will find excerpts from events related to this course:

V

2560136, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)
On-Site

Content

The course *Municipal Finance* addresses the theory and policy of municipal revenues and spending including grants, municipal revenue equalisation, taxation as well as municipal and public enterprises.

At the beginning of the course, fundamental concepts of taxation theory as well as key elements of the German taxation system are introduced. The allocative and distributive effects of different taxation methods are examined thereafter and are combined within the theory of optimal taxation. The following chapter is concerned with municipal borrowing and illustrates ways to acquire additional funding. After addressing the extent, structure and variety of municipal borrowing, macroeconomic theories are introduced and applied to the municipal sector. In the course of this final chapter, special attention will be paid to the long term consequences and the sustainability of municipal borrowing as a means of budgeting.

Learning goals:

The students:

- are familiar with the theory and policy of municipal revenues and spending.
- are able to evaluate the allocative and distributive effects of different kinds of municipal revenues and spending.
- understand the extent, structure and variety of municipal budgeting and are able to assess long term consequences of municipal revenues and spending.

Workload:

The total workload for this course is approximately 135.0 hours. For further information see German version.

Literature

- Ade, K., Notheis, K. & Schmid, H. (2011). *Kommunales Wirtschaftsrecht in Baden Württemberg*. Boorberg-Verlag.
- Aker, B., Hafner, W. & Notheis, K. (2012). *Gemeindeordnung Baden-Württemberg(Kommentar)*. Boorberg-Verlag.
- Groh, M. (1994). Kommunalleasing und Investorenfinanzierung als Private Public Partnership. *Stadt und Gemeinde*, 49. Jahrgang, 09/94.
- Wigger, B. U. (2006). *Grundzüge der Finanzwissenschaft*. Springer-Verlag.
- Diverse Veröffentlichungen des Innenministeriums und Finanzministeriums Baden-Württemberg.

T

7.211 Course: Python Algorithm for Vehicle Technology [T-MACH-110796]

Responsible: Stephan Rhode

Organisation:

Part of: [M-MACH-101265 - Vehicle Development](#)
[M-MACH-101266 - Automotive Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|-------|
| SS 2020 | 2114862 | Python Algorithms for Automotive Engineering | 2 SWS | Lecture (V) | Rhode |

Competence Certificate

Written Examination

Duration: 90 minutes

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Python Algorithms for Automotive Engineering

2114862, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Teaching content:

- Introduction to Python and useful tools and libraries for creating algorithms, graphical representation, optimization, symbolic arithmetic and machine learning
 - [Anaconda](#), [Pycharm](#), [Jupyter](#)
 - [NumPy](#), [Matplotlib](#), [SymPy](#), [Scikit-Learn](#)
- Methods and tools for creating software
 - Version management [GitHub](#), [git](#)
 - Testing software [pytest](#), [Pylint](#)
 - Documentation [Sphinx](#)
 - Continuous Integration (CI) [Travis CI](#)
 - Workflows in Open Source and Inner Source, Kanban, Scrum
- Practical programming projects to:
 - Road sign recognition
 - Vehicle state estimation
 - Calibration of vehicle models by mathematical optimization
 - Data-based modelling of the powertrain of an electric vehicle

Objectives:

The students have an overview of the programming language Python and important Python libraries to solve automotive engineering problems with computer programs. The students know current tools around Python to create algorithms, to apply them and to interpret and visualize their results. Furthermore, the students know basics in the creation of software to be used in later programming projects in order to develop high-quality software solutions in teamwork. Through practical programming projects (road sign recognition, vehicle state estimation, calibration, data-based modelling), the students can perform future complex tasks from the area of driver assistance systems.

Organizational issues

Campus Ost, Geb. 70.04, Raum 219

Termine siehe Institutshomepage

Bitte bringen Sie Ihren Laptop mit zu den Vorlesungen!

Please bring your laptop to the lecture!


Literature





- A Whirlwind Tour of Python, Jake VanderPlas, Publisher: O'Reilly Media, Inc. Release Date: August 2016, ISBN: 9781492037859 [link](#)
- Scientific Computing with Python 3, Olivier Verdier, Jan Erik Solem, Claus Führer, Publisher: Packt Publishing, Release Date: December 2016, ISBN: 9781786463517 [link](#)
- Introduction to Machine Learning with Python, Sarah Guido, Andreas C. Müller, Publisher: O'Reilly Media, Inc., Release Date: October 2016, ISBN: 9781449369880, [link](#)
- Clean Code, Robert C. Martin, Publisher: Prentice Hall, Release Date: August 2008, ISBN: 9780136083238, [link](#)

T

7.212 Course: Quality Management [T-MACH-102107]**Responsible:** Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|------------------------------------|-------|---|-------|
| WS 20/21 | 2149667 | Quality Management | 2 SWS | Lecture (V) /  | Lanza |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Written Exam (60 min)

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Quality Management2149667, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Lecture (V)
Online**

Content

Based on the quality philosophies Total Quality Management (TQM) and Six-Sigma, the lecture will specifically address the needs of a modern quality management. The process orientation in a modern company and the process-specific fields of quality assurance are presented in detail. Preventive as well as non-preventive quality management methods, which are state of the art in operational practice today, are content of the lecture. The use of suitable measurement techniques in production engineering (production measurement technology) as well as their potential levels of integration in the production system are discussed. The use of suitable statistical methods for data analysis and their modern extension by methods of artificial intelligence are be discussed. The contents are complemented by legal aspects in the field of quality management.

Main topics of the lecture:

- The term "Quality"
- Total Quality Management (TQM)
- Six-Sigma and universal methods and tools within the DMAIC cycle
- QM in early product stages – Determination and realization of customer requirements
- QM in product development
- Production measurement technology
- QM in production - statistical methods
- Artificial intelligence and machine learning in quality management
- Operating behaviour and reliability
- Legal aspects in QM

Learning Outcomes:

The students ...

- are capable to comment on the content covered by the lecture.
- are capable of substantially quality philosophies.
- are able to apply the QM tools and methods they have learned about in the lecture to new problems from the context of the lecture.
- are able to analyze and evaluate the suitability of the methods, procedures and techniques they have learned about in the lecture for a specific problem.

Workload:

regular attendance: 21 hours

self-study: 99 hours

Organizational issues

Vorlesungstermine montags 9:45 Uhr

Übung erfolgt während der Vorlesung

Literature**Medien:**

Die Vorlesungsfolien inkl. Notizen zur Veranstaltung werden über ILIAS (<https://ilias.studium.kit.edu/>) bereitgestellt:

Media:

Lecture slides and notes will be provided in ILIAS (<https://ilias.studium.kit.edu/>).

T





7.213 Course: Rail System Technology [T-MACH-102143]





Responsible: Prof. Dr.-Ing. Marcus Geimer
Prof. Dr.-Ing. Peter Gratzfeld

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101274 - Rail System Technology](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------|---------|
| Oral examination | 9 | Each term | 3 |

| Events | | | | | |
|----------|---------|---|-------|---|-----------|
| SS 2020 | 2115919 | Rail System Technology | 2 SWS | Lecture (V) /  | Gratzfeld |
| SS 2020 | 2115996 | Rail Vehicle Technology | 2 SWS | Lecture (V) /  | Gratzfeld |
| WS 20/21 | 2115919 | Rail System Technology | 2 SWS | Lecture (V) /  | Gratzfeld |
| WS 20/21 | 2115996 | Rail Vehicle Technology | 2 SWS | Lecture (V) /  | Gratzfeld |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Oral examination

Duration: ca. 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, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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)

Organizational issues

Die Vorlesung "Bahnsystemtechnik" im SS 2020 findet bis auf weiteres als asynchrone Online-Veranstaltung statt.

Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

V

Rail Vehicle Technology

2115996, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Organizational issues

Die Vorlesung "Schienenfahrzeugtechnik" im SS 2020 findet bis auf weiteres als asynchrone Online-Veranstaltung statt.

Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

**Rail System Technology**

2115919, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Organizational issues

Die Vorlesung "Bahnsystemtechnik" im WS 20/21 findet als asynchrone Online-Veranstaltung statt.

Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

**Rail Vehicle Technology**

2115996, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

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

Organizational issues

Die Vorlesung "Schienenfahrzeugtechnik" im WS 20/21 findet als asynchrone Online-Veranstaltung statt.

Literature

Eine Literaturliste steht den Studierenden auf der Ilias-Plattform zum Download zur Verfügung.

A bibliography is available for download (Ilias-platform).

**7.214 Course: Real Estate Management I [T-WIWI-102744]**

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101466 - Real Estate Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|----------------|------------------------|
| WS 20/21 | 2586400 | Real Estate Management I | 2 SWS | Lecture (V) / | Lützkendorf, Worschech |
| WS 20/21 | 2586401 | Übungen zu Real Estate Management I | 2 SWS | Practice (Ü) / | Worschech |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Prerequisites

None

Annotation

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

Below you will find excerpts from events related to this course:

**Real Estate Management I**

2586400, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Online

Content

The course Real Estate Management I deals with questions concerning the economy of a single building throughout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.

The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course Real Estate Management I deals with questions concerning the economy of a single building throughout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.

The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

Recommendations:

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

The **total workload** for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (winter semester). Re-examinations are offered at every ordinary examination date.

Literature**Weiterführende Literatur:**

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T

7.215 Course: Real Estate Management II [T-WIWI-102745]

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101466 - Real Estate Management](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|------------------------|
| SS 2020 | 2585400 | Real Estate Management II | 2 SWS | Lecture (V) | Lützkendorf, Worschech |
| SS 2020 | 2585401 | Übung zu Real Estate Management II | 2 SWS | Practice (Ü) | Worschech |

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is takes place (summer semester). Reexaminations are offered at every ordinary examination date.

Prerequisites

None

Recommendation

A combination with the module *Design Construction and Assessment of Green Buildings* is recommended. Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Annotation

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

Below you will find excerpts from events related to this course:

V

Real Estate Management II

2585400, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The course Real Estate Management II gives special attention to topics in connection to the management of large real estate portfolios. This especially includes property valuation, market and object rating, maintenance and modernization, as well as real estate portfolio and risk management. The tutorial provides examples in order to practice the application of theoretical knowledge to practical problems.

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

The student

- has an in-depth knowledge on the economic classification and significance of the real estate industry
- has a critical understanding of essential theories, methods and instruments of the real estate industry
- is able to analyze and evaluate activity areas and functions in real estate companies as well as to prepare or to take decisions

Recommendations:

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

The total workload for this course is approximately 135.0 hours. For further information see German version.

The **assessment** consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation). The exam takes place two times only in the semester in which the lecture is taken place (summer semester). Reexaminations are offered at every ordinary examination date.

Literature**Weiterführende Literatur:**

- Gondring (Hrsg.): "Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): "Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): "Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

T

7.216 Course: Remote Sensing, Exam [T-BGU-101636]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|---------|
| SS 2020 | 6020241 | Fernerkundungssysteme | 1 SWS | Lecture (V) | Hinz |
| SS 2020 | 6020242 | Fernerkundungssysteme, Übung | 1 SWS | Practice (Ü) | Weidner |
| SS 2020 | 6020243 | Fernerkundungsverfahren | 2 SWS | Lecture (V) | Weidner |
| SS 2020 | 6020244 | Fernerkundungsverfahren, Übung | 1 SWS | Practice (Ü) | Weidner |

Recommendation

None





T

7.217 Course: Renewable Energy-Resources, Technologies and Economics [T-WIWI-100806]

Responsible: PD Dr. Patrick Jochem
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101464 - Energy Economics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3,5 | Each winter term | 4 |

| Events | | | | | |
|----------|---------|--|-------|---|--------|
| WS 20/21 | 2581012 | Renewable Energy – Resources, Technologies and Economics | 2 SWS | Lecture (V) /  | Jochem |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment consists of a written exam (60 min., in English, answers in English or German).

Prerequisites

None.

Below you will find excerpts from events related to this course:

V

Renewable Energy – Resources, Technologies and Economics

2581012, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)
Online

Content

1. General introduction: Motivation, Global situation
2. Basics of renewable energies: Energy balance of the earth, potential definition
3. Hydro
4. Wind
5. Solar
6. Biomass
7. Geothermal
8. Other renewable energies
9. Promotion of renewable energies
10. Interactions in systemic context
11. Excursion to the "Energieberg" in Mühlburg

Learning Goals:

The student

- understands the motivation and the global context of renewable energy resources.
- gains detailed knowledge about the different renewable resources and technologies as well as their potentials.
- understands the systemic context and interactions resulting from the increased share of renewable power generation.
- understands the important economic aspects of renewable energies, including electricity generation costs, political promotion and marketing of renewable electricity.
- is able to characterize and where required calculate these technologies.

Organizational issues

siehe Institutsaushang

Literature**Weiterführende Literatur:**

- Kaltschmitt, M., 2006, Erneuerbare Energien : Systemtechnik, Wirtschaftlichkeit, Umweltaspekte, aktualisierte, korrigierte und ergänzte Auflage Berlin, Heidelberg : Springer-Verlag Berlin Heidelberg.
- Kaltschmitt, M., Streicher, W., Wiese, A. (eds.), 2007, Renewable Energy: Technology, Economics and Environment, Springer, Heidelberg.
- Quaschnig, V., 2010, Erneuerbare Energien und Klimaschutz : Hintergründe - Techniken - Anlagenplanung - Wirtschaftlichkeit München : Hanser, Ill.2., aktualis. Aufl.
- Harvey, D., 2010, Energy and the New Reality 2: Carbon-Free Energy Supply, Earthscan, London/Washington.
- Boyle, G. (ed.), 2004, Renewable Energy: Power for a Sustainable Future, 2nd Edition, Open University Press, Oxford.

T

7.218 Course: Selected Topics on Optics and Microoptics for Mechanical Engineers [T-MACH-102165]

Responsible: Dr. Mathias Hecke
Dr.-Ing. Timo Mappes

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101287 - Microsystem Technology](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------|---------|
| Oral examination | 3 | Each term | 1 |

Competence Certificate

Oral examination

Prerequisites

none


T


7.219 Course: Seminar Data-Mining in Production [T-MACH-108737]

Responsible: Prof. Dr.-Ing. Gisela Lanza
Organisation: KIT Department of Mechanical Engineering

Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|-------|
| SS 2020 | 2151643 | Seminar Data Mining in Production | 2 SWS | Seminar (S) | Lanza |
| WS 20/21 | 2151643 | Seminar Data Mining in Production | 2 SWS | Seminar (S) /  | Lanza |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

alternative test achievement (graded):

- written elaboration (workload of at least 80 h)
- oral presentation (approx. 30 min)

Prerequisites

none

Annotation

The number of students is limited to twelve. Dates and deadlines for the seminar will be announced at <https://www.wbk.kit.edu/studium-und-lehre.php>.

Below you will find excerpts from events related to this course:

V

Seminar Data Mining in Production

2151643, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

Learning Outcomes:

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

Workload:

regular attendance: 10 hours
 self-study: 80 hours

Organizational issues

Die Teilnehmerzahl ist auf zwölf Studierende begrenzt. Termine und Fristen zur Veranstaltung werden unter <https://www.wbk.kit.edu/studium-und-lehre.php> bekanntgegeben.

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>.

Literature**Medien:**

KNIME Analytics Platform

Media:

KNIME Analytics Platform

**Seminar Data Mining in Production**

2151643, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)
Blended (On-Site/Online)

Content

In the age of Industry 4.0, large amounts of production data are generated by the global production networks and value chains. Their analysis enables valuable conclusions about production and lead to an increasing process efficiency. The aim of the seminar is to get to know production data analysis as an important component of future industrial projects. The students get to know the data mining tool KNIME and use it for analyses. A specific industrial use case with real production data enables practical work and offers direct references to industrial applications. The participants learn selected methods of data mining and apply them to the production data. The work within the seminar takes place in small groups on the computer. Subsequently, presentations on specific data mining methods have to be prepared.

Learning Outcomes:

The students ...

- can name, describe and distinguish between different methods, procedures and techniques of production data analysis.
- can perform basic data analyses with the data mining tool KNIME.
- can analyze and evaluate the results of data analyses in the production environment.
- are able to derive suitable recommendations for action.
- are able to explain and apply the CRISP-DM model.

Workload:

regular attendance: 10 hours

self-study: 80 hours

Organizational issues

Die Teilnehmerzahl ist auf zwölf Studierende begrenzt. Termine und Fristen zur Veranstaltung werden unter <https://www.wbk.kit.edu/studium-und-lehre.php> bekanntgegeben.

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>.

Literature**Medien:**

KNIME Analytics Platform

Media:

KNIME Analytics Platform

T

7.220 Course: Seminar in Business Administration (Bachelor) [T-WIWI-103486]













Responsible: Professorenschaft des Fachbereichs Betriebswirtschaftslehre



Organisation: KIT Department of Economics and Management

Part of: M-WIWI-101816 - Seminar Module

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|--|-------|------------------|--|
| SS 2020 | 2530293 | Seminar in Finance (Bachelor, Prof. Ruckes) | 2 SWS | Seminar (S) | Ruckes, Luedecke, Hoang, Benz, Schubert, Strych, Silbereis |
| SS 2020 | 2530374 | Data-Driven Investments | 2 SWS | Seminar (S) | Ulrich |
| SS 2020 | 2530580 | Seminar in Finance | 2 SWS | Seminar (S) | Uhrig-Homburg, Eska, Schuster, Eberbach, Reichenbacher |
| SS 2020 | 2540524 | Bachelorseminar aus Data Science | 2 SWS | Seminar (S) | Geyer-Schulz, Schweigert, Schweizer |
| SS 2020 | 2545010 | Entrepreneurship Basics (Track 1) | 2 SWS | Seminar (S) | Lau, Terzidis |
| SS 2020 | 2545011 | Entrepreneurship Basics (Track 2) | 2 SWS | Seminar (S) | Terzidis, Böhler |
| SS 2020 | 2571180 | Seminar in Marketing und Vertrieb (Bachelor) | 2 SWS | Seminar (S) | Klarmann, Mitarbeiter, Feurer |
| SS 2020 | 2571181 | Seminar in Marketing und Vertrieb (Master) | 2 SWS | Seminar (S) | Klarmann, Mitarbeiter, Feurer |
| SS 2020 | 2573010 | Seminar Human Resources and Organizations (Bachelor) | 2 SWS | Seminar (S) | Nieken, Mitarbeiter |
| SS 2020 | 2573011 | Seminar Human Resource Management (Bachelor) | 2 SWS | Seminar (S) | Nieken, Mitarbeiter |
| SS 2020 | 2579909 | Seminar Management Accounting | 2 SWS | Seminar (S) | Wouters, Hammann, Disch |
| SS 2020 | 2579919 | Seminar in Management Accounting - Special Topics | 2 SWS | Seminar (S) | Wouters, Ebinger |
| SS 2020 | 2581977 | Seminar Produktionswirtschaft und Logistik II | 2 SWS | Seminar (S) | Volk, Schultmann |
| SS 2020 | 2581980 | Seminar Energiewirtschaft II | 2 SWS | Seminar (S) | Keles |
| SS 2020 | 2581990 | | 2 SWS | Seminar (S) | Schultmann, Schumacher, Baumgartner |
| WS 20/21 | 2500019 | Digital Citizen Science | 2 SWS | Seminar (S) | Weinhardt, Volkamer, Mayer |
| WS 20/21 | 2500125 | Current Topics in Digital Transformation Seminar | 3 SWS | Seminar (S) / 🔄 | Mädche |
| WS 20/21 | 2530374 | Machine Learning for Business Applications | 2 SWS | Seminar (S) / 🖥️ | Ulrich |
| WS 20/21 | 2530580 | Seminar in Finance | 2 SWS | Seminar (S) | Uhrig-Homburg |
| WS 20/21 | 2530610 | Seminar in Financial Economics | 2 SWS | Seminar (S) / 🖥️ | Thimme |
| WS 20/21 | 2540473 | Data Science in Service Management | 2 SWS | Seminar (S) / 🖥️ | Haubner, Dann, Badewitz, Stoeckel |
| WS 20/21 | 2540475 | Electronic Markets & User behavior | 2 SWS | Seminar (S) / 🖥️ | Knierim |
| WS 20/21 | 2540477 | Digital Experience and Participation | 2 SWS | Seminar (S) / 🖥️ | Straub, Peukert, Hoffmann, Puszma, Willrich, Kloepper, Fegert, Greif-Winzrieth |

| | | | | | |
|----------|---------|---|-------|--|--|
| WS 20/21 | 2540478 | Smart Grids and Energy Markets | 2 SWS | Seminar (S) /  | Staudt, Richter, Huber, vom Scheidt, Golla, Schmidt, Henni, Meinke |
| WS 20/21 | 2540524 | Bachelor Seminar aus Data Science | 2 SWS | Seminar (S) | Geyer-Schulz, Schweizer, Nazemi |
| WS 20/21 | 2540557 | Information Systems and Service Design Seminar | 3 SWS | Seminar (S) | Mädche |
| WS 20/21 | 2545010 | Entrepreneurship Basics (Track 1) | 2 SWS | Seminar (S) /  | Terzidis, Tittel |
| WS 20/21 | 2545011 | Entrepreneurship Basics (Track 2) | 2 SWS | Seminar (S) /  | Böhrer, Terzidis |
| WS 20/21 | 2573010 | Seminar: Human Resources and Organizations (Bachelor) | 2 SWS | Seminar (S) /  | Nieken, Mitarbeiter |
| WS 20/21 | 2573011 | Seminar: Human Resource Management (Bachelor) | 2 SWS | Seminar (S) /  | Nieken, Mitarbeiter |
| WS 20/21 | 2579910 | Entrepreneurial Strategy and Financing of Start-Ups | 2 SWS | Seminar (S) /  | Burkardt |
| WS 20/21 | 2579919 | Seminar Management Accounting - Special Topics | 2 SWS | Seminar (S) /  | Riar, Wouters, Ebinger |
| WS 20/21 | 2581976 | Seminar in Production and Operations Management I | 2 SWS | Seminar (S) /  | Glöser-Chahoud, Schultmann |
| WS 20/21 | 2581977 | Seminar in Production and Operations Management II | 2 SWS | Seminar (S) /  | Volk, Schultmann |
| WS 20/21 | 2581978 | Seminar in Production and Operations Management III | 2 SWS | Seminar (S) /  | Wiens, Schultmann |
| WS 20/21 | 2581980 | | 2 SWS | Seminar (S) /  | Yilmaz, Fraunholz, Dehler-Holland, Kraft |
| WS 20/21 | 2581981 | | 2 SWS | Seminar (S) /  | Ardone, Sandmeier, Scharnhorst |
| WS 20/21 | 2581990 | | 2 SWS | Seminar (S) | Schumacher, Schultmann |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation


See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

| | | |
|---|--|--------------------|
|  | Data-Driven Investments 2530374, SS 2020, 2 SWS, Language: English, Open in study portal | Seminar (S) |
|---|--|--------------------|

Content

The digitalization is not only changing today's society but also companies' business models, in particular of the financial industry. In general, the large variety of digitalized processes and connected devices (Industry 4.0) generates a huge amount of data which can be used to extract valuable (investment) insights. For this task data science skills are essential.

In this seminar we will use modern data science techniques to analyze all kinds of financial and economic data, ranging from big data intra-day option prices to alternative datasets, like textual statements. For this empirical analysis we will use the state of the art Python programming language.

In a bi-weekly schedule you and your supervisor will first learn and discuss important data science concepts and then apply it in a practical FinTech-type analysis using real-world data. As a prerequisite students should already have basic finance knowledge.

Organizational issues

Blücherstr. 17, E009; Blockseminar tba

**Seminar in Finance**

2530580, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)**Organizational issues****Termine**

1. Termin laut Ankündigung des Lehrstuhls

02.07. von 8 bis 19 Uhr

03.07. von 8 bis 19 Uhr

Alle Termine finden in Geb. 09.21 statt.

Literature

Wird jeweils am Ende des vorherigen Semesters bekanntgegeben.

**Seminar Human Resources and Organizations (Bachelor)**

2573010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)**Content**

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues

Geb. 05.20, Raum 2A-12.1, Termine werden bekannt gegeben

**Seminar Human Resource Management (Bachelor)**

2573011, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues

Geb. 05.20, Raum 2A-12.1, Termine werden bekannt gegeben

**Seminar Management Accounting**

2579909, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. You are to a large extent free to select your own topic. The seminar course is concentrated in four meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Examination:

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

Required prior Courses:

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

Note:

- Maximum of 16 students.

Organizational issues

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

Literature

Will be announced in the course.

**Seminar in Management Accounting - Special Topics**2579919, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Seminar (S)

Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Examination:

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

Required prior Courses:

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

Note:

- Maximum of 16 students.

Organizational issues

Geb.05.20, 2A-12.1; Termine werden bekannt gegeben

Literature

Will be announced in the course.

**Digital Citizen Science**2500019, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Content

Digital Citizen Science is an innovative approach to conduct field research - interactively and in the real world. Especially in times of social distancing measures essential questions about how private lives are changing are investigated. Who is experiencing more stress during HomeOffice hours? Who is flourishing while learning at home because flow is experienced more often? Which formats of digital cooperation are fostering social contacts and bonding? These and other questions that target the main topic: Well-being @Home are focused in these seminar projects.

The seminar theses are supervised by academics from multiple institutes that are working together on the topic of Digital Citizen Science arbeiten. Involved are the research groups of Prof. Mädche, Prof. Nieken, Prof. Scheibehenne, Prof. Szech, Prof. Volkamer, Prof. Weinhardt and Prof. Woll.

**Machine Learning for Business Applications**2530374, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)Seminar (S)
Online**Content**

Machine learning (ML) is changing virtually every aspect of our lives. Today ML algorithms accomplish tasks that until recently only expert humans could perform. As it relates to finance, this is the most exciting time to adopt a disruptive technology that will transform how everyone invests for generations.

In this seminar we will apply modern machine learning techniques hands on to various business applications.

Organizational issues

Blockseminar tba

**Data Science in Service Management**2540473, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)**Seminar (S)**
Online**Content**

wird auf deutsch und englisch gehalten

Organizational issues

Blockveranstaltung, siehe WWW

**Bachelor Seminar aus Data Science**2540524, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)****Literature****Weiterführende Literatur:**

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

**Entrepreneurship Basics (Track 1)**2545010, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**
Online**Content**

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

**Entrepreneurship Basics (Track 2)**2545011, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Seminar (S)**
Online

Content

):

The seminar introduces students to basic concepts of business planning for entrepreneurs. This involves concepts for the concretization of business ideas (development of business models), market potential estimation, resource planning, etc.) as well as the creation of an executable business plan (with or without VC financing).

The primary focus of the seminar is on working with the Business Model Canvas and developing a value proposition.

Learning objectives:

After attending, students have learned how to use a structured process to take the first steps in starting a business to identify and minimize their most important risks. In particular, they have practical experience in identifying and validating 1) relevant customer issues, 2) designing and testing solutions to these problems, 3) targeting and assessing their accessibility, and 4) their willingness to pay. In doing so, they have learned to know and apply the business model canvas, methods for developing value propositions, rapid prototyping and target group interviews. In addition, they have learned to work efficiently in a team through the use of communication strategies.

Credentials:

Registration is via the Wiwi portal.

Exam:

Presentation + active participation + paper.

Target group:

Bachelor students

**Seminar: Human Resources and Organizations (Bachelor)**

2573010, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)
Online**

Content

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of human resources and organizations.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.

Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

Literature

Selected journal articles and books.

Organizational issues

Blockveranstaltung siehe Homepage

**Seminar: Human Resource Management (Bachelor)**

2573011, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)
Online**

Content

The topics are redefined each semester on basis of current research topics. The topics will be announced on the website of the Wiwi-Portal.

Aim

The student

- looks critically into current research topics in the fields of Human Resource Management and Personnel Economics.
- trains his / her presentation skills.
- learns to get his / her ideas and insights across in a focused and concise way, both in oral and written form, and to sum up the crucial facts.
- cultivates the discussion of research approaches.

Workload

The total workload for this course is: approximately 90 hours.


Lecture: 30h

Preparation of lecture: 45h

Exam preparation: 15h

Literature

Selected journal articles and books.

| | | |
|---|--|--------------------------------|
|  | Seminar Management Accounting - Special Topics 2579919, WS 20/21, 2 SWS, Language: English, Open in study portal | Seminar (S) On-Site |
|---|--|--------------------------------|

Content

The course will be a mix of lectures, discussions, and student presentations. Students will write a paper in small groups, and present this in the final week. Topics are selectively prediscibed. The seminar course is concentrated in several meetings that are spread throughout the semester.

Learning objectives:

- Students are largely independently able to identify a distinct topic in Management Accounting,
- Students are capable to research the topic, analyze the information, to conceptualize and deduct fundamental principles and relationships from relatively unstructured information,
- Students can afterwards logically and systematically present the results in writing and as an oral presentation, following a scientific approach (structuring, terminology, sources).

Examination:

- The performance review is carried out in the form of a "Prüfungsleistung anderer Art" (following § 4 (2) No. 3 of the examination regulation), which in this case is an essay the seminar participants prepare in group work.
- The final grade of the course is the grade awarded to the paper.

Required prior Courses:

- The LV "Betriebswirtschaftslehre: Finanzwirtschaft und Rechnungswesen" (2600026) must have been completed before starting this seminar.

Workload:

- The total workload for this course is approximately 90 hours. For further information see German version.

Note:

- Maximum of 16 students.

Literature

Will be announced in the course.

**7.221 Course: Seminar in Economics (Bachelor) [T-WIWI-103487]****Responsible:** Professorenschaft des Fachbereichs Volkswirtschaftslehre**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---------------|--------------------------------------|
| SS 2020 | 2560241 | Digital IT Solutions and Services transforming the Field of Public Transportation | 2 SWS | Prüfung (PR) | Janoshalmi |
| SS 2020 | 2560554 | Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor) | 2 SWS | Seminar (S) | Szech, Zhao |
| SS 2020 | 2560556 | Designing the Digital Economy, Topics on Political Economy (Bachelor) | 2 SWS | Seminar (S) | Szech, Huber |
| WS 20/21 | 2521310 | Topics in Econometrics | 2 SWS | Seminar (S) / | Schienle, Chen, Görden, Krüger, Buse |
| WS 20/21 | 2560140 | Topics in Political Economy (Bachelor) | 2 SWS | Seminar (S) / | Szech, Huber |
| WS 20/21 | 2560141 | Morals & Social Behavior (Bachelor) | 2 SWS | Seminar (S) / | Szech, Zhao |
| WS 20/21 | 2560142 | Topics in Political Economy (Master) | 2 SWS | Seminar (S) / | Szech, Huber |
| WS 20/21 | 2561208 | Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung | 1 SWS | Seminar (S) / | Szimba |
| WS 20/21 | 2561281 | Wirtschaftspolitisches Seminar | 2 SWS | Seminar (S) / | Ott |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

RecommendationSee 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:*

**Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor)**

Seminar (S)

2560554, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Content**

For Master students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

The acceptance of students for the seminar is based on preferences and suitability for the topics. This includes theoretical and practical experience with Behavioral Economics as well as English skills.

Seminar Papers of 8–10 pages are to be handed in.

Students' grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally students will have to hand in two abstracts with different lengths (20%). Students can improve their grades by actively participating in the discussions of the presentations.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

Organizational issues

Blockveranstaltung

**Designing the Digital Economy, Topics on Political Economy (Bachelor)**

Seminar (S)

2560556, SS 2020, 2 SWS, Language: English, [Open in study portal](#)**Topics in Econometrics**Seminar (S)
Online2521310, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)**Organizational issues**

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

**Topics in Political Economy (Bachelor)**Seminar (S)
Online2560140, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)**Content**

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Econometrics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in one individual abstract of 75-100 words. The quality of abstracts will reflect with 25% in the final grade.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

**Morals & Social Behavior (Bachelor)**Seminar (S)
Online2560141, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

Content

For Bachelor students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in one individual abstract of 75-100 words. The quality of abstracts will reflect with 25% in the final grade.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

Organizational issues

Application is possible via <https://portal.wiwi.kit.edu/Seminare>

**Topics in Political Economy (Master)**

2560142, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Seminar (S)
Online**

Content

For Master students of the fields Industrial Engineering and Management, Information Engineering and Management, Economics Engineering or Economathematics.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see <http://polit.econ.kit.edu> or <https://portal.wiwi.kit.edu/Seminare>

Seminar Papers of 8–10 pages are to be handed in.



For Master students, grades will be based on the quality of presentation slides (25%) and the seminar paper (50%). Additionally each student will have to hand in two individual abstracts – one with 75-100 words and one with 150-200 words. The quality of abstracts will reflect with 25% in the final grade.





Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

T

7.222 Course: Seminar in Engineering Science Master (approval) [T-WIWI-108763]**Responsible:** Fachvertreter ingenieurwissenschaftlicher Fakultäten**Organisation:** KIT Department of Economics and Management**Part of:** [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-----|---|-----------------|
| SS 2020 | 2119100 | Fördertechnik und Logistiksysteme | SWS | Seminar (S) /  | Furmans, Pagani |
| WS 20/21 | 2119100 | Fördertechnik und Logistiksysteme | SWS | Seminar (S) /  | Furmans, Pagani |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

See German version.

Prerequisites

See module description.

Recommendation

None

Below you will find excerpts from events related to this course:

V

Fördertechnik und Logistiksysteme2119100, SS 2020, SWS, [Open in study portal](#)Seminar (S)
Blended (On-Site/Online)**Content**

The goal of the seminar is to deal with different topics related to the materials handling and logistics. The students can work on the topic either alone or in a group work. At the end the results are presented and discussed with a final presentation. The prepare the work for the seminar an introductory event is scheduled at the beginning.

Organizational issues









Ort: Gebäude 50.38, Raum 0.22, Termine siehe homepage





T

7.223 Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]

Responsible: Professorenschaft des Fachbereichs Informatik**Organisation:** KIT Department of Economics and Management**Part of:** M-WIWI-101816 - Seminar Module

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|---|
| SS 2020 | 2513212 | Seminar Business Information Systems: Artificial Intelligence and Robotic Process Automation (Bachelor) | 2 SWS | Seminar (S) | Oberweis, Alpers, Goranov |
| SS 2020 | 2513308 | Seminar Knowledge Discovery and Data Mining (Bachelor) | 3 SWS | Seminar (S) | Sure-Vetter, Herbold, Färber, Nguyen, Noullet, Saier |
| SS 2020 | 2513310 | Seminar Data Science & Real-time Big Data Analytics (Bachelor) | 2 SWS | Seminar (S) | Sure-Vetter, Riemer, Zehnder |
| SS 2020 | 2513402 | Emerging Trends in Internet Technologies (Bachelor) | 2 SWS | Seminar (S) | Lins, Sunyaev, Thiebes |
| SS 2020 | 2513404 | Emerging Trends in Digital Health (Bachelor) | 2 SWS | Seminar (S) | Lins, Sunyaev, Thiebes |
| SS 2020 | 2513500 | Cognitive Automobiles and Robots | 2 SWS | Seminar (S) | Zöllner |
| SS 2020 | 2513554 | Seminar Security, Usability and Society (Bachelor) | 2 SWS | Seminar (S) | Volkamer, Aldag, Berens, Mayer, Mossano, Düzgün |
| SS 2020 | 2595470 | Seminar Service Science, Management & Engineering | 2 SWS | Seminar (S) | Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm |
| WS 20/21 | 2513200 | Seminar Programming 3 (Bachelor) | 2 SWS | Seminar (S) /  | Oberweis, Zöllner, Frister, Fritsch, Struppek, Forell |
| WS 20/21 | 2513214 | Seminar Information security and data protection (Bachelor) | 2 SWS | Seminar (S) /  | Oberweis, Volkamer, Raabe, Alpers, Düzgün, Schiefer, Wagner |
| WS 20/21 | 2513312 | Seminar Linked Data and the Semantic Web (Bachelor) | 2 SWS | Seminar (S) /  | Färber, Käfer, Heling, Bartscherer |
| WS 20/21 | 2513313 | Seminar Linked Data and the Semantic Web (Master) | 2 SWS | Seminar (S) /  | Färber, Käfer, Heling, Bartscherer |
| WS 20/21 | 2513314 | Seminar Real-World Challenges in Data Science and Analytics (Bachelor) | 3 SWS | Seminar (S) /  | Nickel, Weinhardt, Färber, Zehnder, Brandt |
| WS 20/21 | 2513315 | Seminar Real-World Challenges in Data Science and Analytics (Master) | 3 SWS | Seminar (S) /  | Nickel, Weinhardt, Färber, Zehnder, Brandt |
| WS 20/21 | 2513500 | Seminar Cognitive Automobiles and Robots (Master) | 2 SWS | Seminar (S) /  | Zöllner |
| WS 20/21 | 2513550 | Seminar Security, Usability and Society (Bachelor) | 2 SWS | Seminar (S) /  | Volkamer, Aldag, Düzgün, Mayer, Mossano, Berens |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

Annotation

Placeholder for seminars offered by the Institute AIFB. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

| | | |
|---|---|--------------------|
|  | Seminar Knowledge Discovery and Data Mining (Bachelor) 2513308, SS 2020, 3 SWS, Language: English, Open in study portal | Seminar (S) |
|---|---|--------------------|

Content

In this seminar different machine learning and data mining methods are implemented.

The seminar includes different methods of machine learning and data mining. Participants of the seminar should have basic knowledge of machine learning and programming skills.

Domains of interest include, but are not limited to:

- Medicine
- Social Media
- Finance Market

The exact dates and information for registration will be announced at the event page.

Organizational issues


Die Anmeldung erfolgt über das WiWi Portal <https://portal.wiwi.kit.edu/>.

Für weitere Fragen bezüglich des Seminar und der behandelten Themen wenden Sie sich bitte an die entsprechenden Verantwortlichen.

Literature

Detaillierte Referenzen werden zusammen mit den jeweiligen Themen angegeben. Allgemeine Hintergrundinformationen ergeben sich z.B. aus den folgenden Lehrbüchern:

- Mitchell, T.; Machine Learning
- McGraw Hill, Cook, D.J. and Holder, L.B. (Editors) Mining Graph Data, ISBN:0-471-73190-0
- Wiley, Manning, C. and Schütze, H.; Foundations of Statistical NLP, MIT Press, 1999.

| | | |
|---|---|--------------------|
|  | Seminar Data Science & Real-time Big Data Analytics (Bachelor) 2513310, SS 2020, 2 SWS, Language: English, Open in study portal | Seminar (S) |
|---|---|--------------------|

Content

In this seminar, students will design applications in teams that use meaningful and creative Event Processing methods. Thereby, students have access to an existing record.

Event processing and real-time data are everywhere: financial market data, sensors, business intelligence, social media analytics, logistics. Many applications collect large volumes of data in real time and are increasingly faced with the challenge of being able to process them quickly and react promptly. The challenges of this real-time processing are currently also receiving a great deal of attention under the term "Big Data". The complex processing of real-time data requires both knowledge of methods for data analysis (data science) and their processing (real-time analytics). Seminar papers are offered on both of these areas as well as on interface topics, the input of own ideas is explicitly desired.

Further information to the seminar is given under the following Link:

<http://seminar-cep.fzi.de>

Questions are answered via the e-mail address sem-ep@fzi.de.

Organizational issues

Further information as well as the registration form can be found under the following link:

<http://seminar-cep.fzi.de>

Questions are answered via the e-mail address sem-ep@fzi.de.

**Cognitive Automobiles and Robots**

2513500, SS 2020, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)

Content

The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

The individual projects require the analysis of the task at hand, selection of suitable procedures, specification and theoretical evaluation of the approach taken. Finally, the chosen solution has to be documented and presented in a short presentation.

Learning objectives:

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

Recommendations:

Attendance of the lecture machine learning

Workload:

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

Organizational issues

Anmeldung und weitere Informationen sind im Wiwi-Portal zu finden.

Registration and further information can be found in the WiWi-portal.

**Seminar Security, Usability and Society (Bachelor)**

2513554, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content**Seminar:**

The main topic of this seminar is security, usability, and society. The goal is to analyze these topics from different perspectives. Always important is the human, as we are interested in how humans interact with certain problems and how it might be possible to tackle it. For instance, phishing detection, how is it possible to ensure a higher detection. To tackle this problem, you can either focus on the technical side, awareness training, regulations by organizations.

Further important information:

Because of the current situation, every meeting will be held online. This might change during the semester, depending on the course of the corona situation.

Important dates:

- Kick-Off 22.04
- Final submission 01.07
- Presentation 14.07

Topics:

Further explanations of the topics will be announced asap.

- Systematic literature review on security interventions in the context of address bar
- Systematic literature review on security seals in the context of online shops/ IoT devices
- Security and privacy threat analysis of eScooters
- Systematic media-based review - Experts and media response to privacy issues related to the Corona outbreak. (english only)
- Systematic literature review of eye tracking studies in the context of security and privacy
- Key factors in "good" phishing emails

This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website https://secuso.aifb.kit.edu/Studium_und_Lehre.php.

**Seminar Service Science, Management & Engineering**

2595470, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content

Each Semester, the seminar will cover topics from a different selected subfield of Service Science, Management & Engineering. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

See the KSRI website for more information about this seminar: www.ksri.kit.edu

Learning objectives:

The student

- illustrates and evaluates classic and current research questions in service science, management and engineering,
- applies models and techniques in service science, also with regard to their applicability in practical cases,
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.

As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Recommendations:

Lecture *eServices* [2595466] is recommended.

Workload:

The total workload for this course is approximately 90 hours.

Organizational issues

siehe Ankündigung des Instituts

Literature

Die Basisliteratur wird entsprechend der zu bearbeitenden Themen bereitgestellt.

**Seminar Programming 3 (Bachelor)**

2513200, WS 20/21, 2 SWS, [Open in study portal](#)

Seminar (S)
Online

Content

Registration information and the content of the seminar will be announced on the course page. Only bachelor students are allowed to attend this seminar.

**Seminar Linked Data and the Semantic Web (Bachelor)**

2513312, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)
Online**

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.

**Seminar Linked Data and the Semantic Web (Master)**

2513313, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

**Seminar (S)
Online**

Content

Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this seminar is to build applications and devise algorithms that consume, provide, or analyse Linked Data.

The Linked Data principles are a set of practices for data publishing on the web. Linked Data builds on the web architecture and uses HTTP for data access, and RDF for describing data, thus aiming towards web-scale data integration. There is a vast amount of data available published according to those principles: recently, 4.5 billion facts have been counted with information about various domains, including music, movies, geography, natural sciences. Linked Data is also used to make web-pages machine-understandable, corresponding annotations are considered by the big search engine providers. On a smaller scale, devices on the Internet of Things can also be accessed using Linked Data which makes the unified processing of device data and data from the web easy.

In this seminar, students will build prototypical applications and devise algorithms that consume, provide, or analyse Linked Data. Those applications and algorithms can also extend existing applications ranging from databases to mobile apps.

For the seminar, programming skills or knowledge about web development tools/technologies are highly recommended. Basic knowledge of RDF and SPARQL are also recommended, but may be acquired during the seminar. Students will work in groups. Seminar meetings will take place as 'Block-Seminar'.

Topics of interest include, but are not limited to:

- Travel Security
- Geo data
- Linked News
- Social Media

The exact dates and information for registration will be announced at the event page.



Seminar Real-World Challenges in Data Science and Analytics (Bachelor)

2513314, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Online

Content

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.



Seminar Real-World Challenges in Data Science and Analytics (Master)

2513315, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Online

Content

In the seminar, various Real-World Challenges in Data Science and Analytics will be worked on.

During this seminar, groups of students work on a case challenge with data provided. Here, the typical process of a data science project is depicted: integration of data, analysis of these, modeling of the decisions and visualization of the results.

During the seminar, solution concepts are worked out, implemented as a software solution and presented in an intermediate and final presentation. The seminar "Real-World Challenges in Data Science and Analytics" is aimed at students in master's programs.

The exact dates and information for registration will be announced at the course page.



Seminar Cognitive Automobiles and Robots (Master)

2513500, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

Seminar (S)
Online

Content

The seminar is intended as a theoretical supplement to lectures such as "Machine Learning". The theoretical basics will be deepened in the seminar. The aim of the seminar is that the participants work individually to analyze a subsystem from the field of robotics and cognitive systems using one or more procedures from the field of AI/ML.

The individual projects require the analysis of the task at hand, selection of suitable procedures, specification and theoretical evaluation of the approach taken. Finally, the chosen solution has to be documented and presented in a short presentation.

Learning objectives:

- Students can apply knowledge from the Machine Learning lecture in a selected field of current research in robotics or cognitive automobiles for theoretical analysis.
- Students can evaluate, document and present their concepts and results.

Recommendations:

Attendance of the lecture machine learning

Workload:

The workload of 3 credit points consists of the time spent on literature research and planning/specifying the proposed solution. In addition, a short report and a presentation of the work carried out will be prepared.

Organizational issues

Anmeldung und weitere Informationen sind im Wiwi-Portal zu finden.

Registration and further information can be found in the WiWi-portal.

T

7.224 Course: Seminar in Mathematics (Bachelor) [T-MATH-102265]

Responsible: Dr. Martin Folkers
Prof. Dr. Günter Last

Organisation: KIT Department of Mathematics

Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Version |
|-----------------------------|---------|---------|
| Examination of another type | 3 | 1 |

**7.225 Course: Seminar in Operations Research (Bachelor) [T-WIWI-103488]**

Responsible: Prof. Dr. Stefan Nickel
 Prof. Dr. Steffen Rebennack
 Prof. Dr. Oliver Stein

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---------------|----------------------|
| SS 2020 | 2550472 | Seminar on Power Systems Optimization (Bachelor) | 2 SWS | Seminar (S) | Rebennack |
| SS 2020 | 2550491 | Seminar: Modern OR and Innovative Logistics | 2 SWS | Seminar (S) | Nickel, Mitarbeiter |
| WS 20/21 | 2550131 | Seminar on Methodical Foundations of Operations Research | 2 SWS | Seminar (S) / | Stein, Neumann |
| WS 20/21 | 2550472 | Seminar on Power Systems Optimization (Bachelor) | 2 SWS | Seminar (S) / | Rebennack, Warwicker |
| WS 20/21 | 2550491 | Seminar: Modern OR and Innovative Logistics | 2 SWS | Seminar (S) / | Nickel, Mitarbeiter |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

**Seminar: Modern OR and Innovative Logistics**

2550491, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

The topics of the seminar will be announced at the beginning of the term in a preliminary meeting. Attendance is compulsory for the preliminary meeting as well for all seminar presentations.

Exam:

The assessment consists of a written seminar thesis of 20-25 pages and a presentation of 35-40 minutes (according to §4(2), 3 of the examination regulation).

The final mark for the seminar consists of the seminar thesis, the seminar presentation, the handout, and if applicable further material such as programming code.

The seminar can be attended both by Bachelor and Master students. A differentiation will be achieved by different valuation standards for the seminar thesis and presentation.

Requirements:

If possible, at least one module of the institute should be taken before attending the seminar.

Objectives:

The student

- illustrates and evaluates classic and current research questions in discrete optimization,
- applies optimization models and algorithms in discrete optimization, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management),
- successfully gets in touch with scientific working by an in-depth working on a special scientific topic which makes the student familiar with scientific literature research and argumentation methods,
- acquires good rhetorical and presentation skills.


As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.

Organizational issues

wird auf der Homepage dol.ior.kit.edu bzw. auf dem WiWi-Portal bekannt gegeben

Literature

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

| | | |
|---|---|-------------------------------------|
|  | Seminar on Methodical Foundations of Operations Research 2550131, WS 20/21, 2 SWS, Language: German, Open in study portal | Seminar (S) Online |
|---|---|-------------------------------------|

Content

The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor student are introduced to the style of scientific work. By focussed treatment of a scientific topic they deal with the basics of scientific investigation and reasoning.

For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.

With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientific reasoning. Also rethoric abilities may be improved.

Remarks:

Attendance at all oral presentations is compulsory.

Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:

The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation. The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:

The total workload for this course is approximately 90 hours. For further information see German version.

Organizational issues

Blockveranstaltung, Termin n. V.

Literature

Die Literatur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbesprechung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a preparatory meeting.

**Seminar: Modern OR and Innovative Logistics**

2550491, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)
Online**

Content

The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

Organizational issues

wird auf der Homepage bekannt gegeben

Literature

Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.

T


7.226 Course: Seminar in Statistics (Bachelor) [T-WIWI-103489]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---|--------------------------------------|
| WS 20/21 | 2521310 | Topics in Econometrics | 2 SWS | Seminar (S) /  | Schienle, Chen, Görgen, Krüger, Buse |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

Prerequisites

None.

Recommendation

See seminar description in the course catalogue of the KIT (<https://campus.kit.edu/>)

Annotation

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the KIT. In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

The available places are listed on the internet: <https://portal.wiwi.kit.edu>.

Below you will find excerpts from events related to this course:

V

Topics in Econometrics

2521310, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Seminar (S)
Online**

Organizational issues

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben

**7.227 Course: Seminar Production Technology [T-MACH-109062]**

Responsible: Prof. Dr.-Ing. Jürgen Fleischer
 Prof. Dr.-Ing. Gisela Lanza
 Prof. Dr.-Ing. Volker Schulze

Organisation: KIT Department of Mechanical Engineering

Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|-----------------------------------|
| SS 2020 | 2149665 | Seminar Production Technology | 1 SWS | Seminar (S) | Fleischer, Lanza, Schulze, Zanger |

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:

**Seminar Production Technology**

2149665, SS 2020, 1 SWS, Language: German, [Open in study portal](#)

Seminar (S)

Content

In course of the seminar Production Technology current issues of the wbk main fields of research "Manufacturing and Materials Technology", "Machines, Equipment and Process Automation" as well as "Production Systems" are discussed.

The specific topics are published on the homepage of the wbk Institute of Production Science.

Learning Outcomes:

The students ...

- are in a position to independently handle current, research-based tasks according to scientific criteria.
- are able to research, analyze, abstract and critically review the information.
- can draw own conclusions using their interdisciplinary knowledge from the less structured information and selectively develop current research results.
- can logically and systematically present the obtained results both orally and in written form in accordance with scientific guidelines (structuring, technical terminology, referencing). They can argue and defend the results professionally in the discussion.

Workload:

regular attendance: 10 hours

self-study: 80 hours

Organizational issues

siehe <http://www.wbk.kit.edu/seminare.php>

**7.228 Course: Seminar: Legal Studies I [T-INFO-101997]**

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: [M-WIWI-101816 - Seminar Module](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 3 | Each term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---------------|---|
| SS 2020 | 2400041 | Governance, Risk & Compliance | 2 SWS | Seminar (S) | Herzig |
| SS 2020 | 2400061 | Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung | 2 SWS | Seminar (S) | Bless, Boehm, Hartenstein, Madche, Sunyaev, Zitterbart |
| SS 2020 | 2400153 | Online Manipulative Practices: New Technologies and Fundamental Rights Infringements | 2 SWS | Seminar (S) | Boehm |
| WS 20/21 | 2400060 | Data in Software-Intensive Technical Systems – Modeling – Analysis – Protection | 2 SWS | Seminar (S) / | Reussner, Raabe, Muller-Quade |
| WS 20/21 | 2400133 | Hate speech & Fake news – Das ubliche Recht in der „postrationalen Konstellation“? | 2 SWS | Seminar (S) / | Eichenhofer |
| WS 20/21 | 2400240 | Grundfragen Ethik und IT | 2 SWS | Seminar (S) / | Dreier |
| WS 20/21 | 24389 | IT-Sicherheit und Recht | 2 SWS | Seminar (S) / | Schallbruch |
| WS 20/21 | 2513214 | Seminar Information security and data protection (Bachelor) | 2 SWS | Seminar (S) / | Oberweis, Volkamer, Raabe, Alpers, Duzgun, Schiefer, Wagner |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Below you will find excerpts from events related to this course:

**Internet und Gesellschaft - gesellschaftliche Werte und technische Umsetzung**

2400061, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

Content

Registration via <https://portal.wiwi.kit.edu/ys/2708>

Organizational issues

nach Vereinbarung

**Online Manipulative Practices: New Technologies and Fundamental Rights Infringements**

2400153, SS 2020, 2 SWS, [Open in study portal](#)

Seminar (S)

Content

New science-based technologies are fostering the process of making individuals more amenable to forms of manipulation online. The more technological capabilities improve, the more surveillance expands, the life of individuals becomes transparent, easier to predict and therefore easier to manipulate. More invasive practices lead to infringements of fundamental rights, which are not always easy to detect, as surveillance and manipulation techniques are getting more sophisticated and less obvious. After the now notorious Cambridge Analytica data scandal, we have now hard evidence individuals are exposed to manipulative practices online, which are most of the time difficult to detect as they operate silently and automatically. Manipulative practices aim at covertly subverting another person's capacity for conscious decision-making by exploiting in particular his/her cognitive, emotional, or other decision-making vulnerabilities. They involve influences that (1) are hidden, (2) exploit vulnerabilities, and (3) are targeted. The seminar has the objective to discuss a series of new technologies and techniques that are and can be used in online manipulative practices and analyse their legal and ethical implications. Special attention is dedicated to the risk such practices pose to fundamental rights such as the right to privacy, the right to the protection of personal data and the right to non-discrimination.

10 sub-topics are provided below. It is a list of new technologies and techniques that can be used in manipulative practices. Students should pick one sub-topic in order to write a short paper and prepare a presentation. Students work is guided through a series of questions and a list of recommended literature. In short, papers and presentations should be generally structured in this way:

- Describe the technology/techniques.
- Describe the legal and ethical implications stemming from the use and application of the selected technology/techniques. What fundamental rights are at stake?
- Focus on one legal aspect, for example the infringement of the right to privacy, (the sub-topic title and description and list of literature already guide the student in this sense), analyse the current legal framework concerning the protection of that right and describe the legal challenges that these new technologies and methods pose.

We also encourage students to investigate possible technical solutions to the problems highlighted in their analysis.

Organizational issues

ACHTUNG: Es handelt sich um ein Seminar für **MASTER**-Studierende!

**7.229 Course: Services Marketing and B2B Marketing [T-WIWI-102806]**

Responsible: Dr. Sven Feurer
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101424 - Foundations of Marketing](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---------------|--------|
| WS 20/21 | 2572158 | Services Marketing and B2B Marketing | 2 SWS | Lecture (V) / | Feurer |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

Prerequisites

None

Annotation

For further information please contact the Marketing & Sales Research Group (marketing.iism.kit.edu).

Below you will find excerpts from events related to this course:

**Services Marketing and B2B Marketing**

2572158, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
Online**

Content

The aim of this course is to prepare students for two certain marketing perspectives. The service marketing is concentrated on the particularities coming up when a company sells services instead of products. Subjects in this section are for example:

- Measuring service quality
- Pricing services
- Management of service staff

The second part of the course contains a business-to-business marketing perspective. Topics are below others:

- Management of buying centers
- Competitive Bidding
- B2B-Branding

Students

- know about the characteristics of service- and B2B environments
- are able to apply different methods (SERVQUAL, Gap-model, Mystery Shopping) to measure the quality of services
- are able to design pricing systems for services
- know about queuing management
- are able to plan capacities in service environments
- are able to identify different types of B2B businesses and know about their characteristics
- know about the specifics and challenges of B2B branding
- know central theories about organizational buying
- are able to apply the concept of competitive bidding for tenders
- are able to prepare, conduct, and review price negotiations

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

The total workload for this course is approximately 90 hours.

For further information please contact Marketing & Sales Research Group (marketing.iism.kit.edu).

Literature

Homburg, Christian (2016), Marketingmanagement, 6. Aufl., Wiesbaden.

T

7.230 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 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 2 |

| Events | | | | | |
|---------|---------|---|-------|-------------|---------------------|
| SS 2020 | 2114095 | Simulation of Coupled Systems | 2 SWS | Lecture (V) | Geimer, Xiang, Daiß |

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 is 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.

Recommendation

- Knowledge of ProE (ideally in actual version)
- Basic knowledge of Matlab/Simulink
- Basic knowledge of dynamics of machines
- 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 hydraulics 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

2114095, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

It is recommended to have:

- Knowledge of ProE (ideally in current version)
- Basic knowledge of Matlab/Simulink
- Basic knowledge of dynamics of machines
- Basic knowledge of hydraulics

- regular attendance: 21 hours
- total self-study: 92 hours

Literature**Weiterführende Literatur:**

- Diverse Handbücher zu den Softwaretools in PDF-Form
- Informationen zum verwendeten Radlader

T

7.231 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 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 0 | Each summer term | 1 |

Competence Certificate

Preparation of semester report

Prerequisites

none

T

7.232 Course: Social Science A (WiWi) [T-GEISTSOZ-109048]**Responsible:** Prof. Dr. Gerd Nollmann**Organisation:** KIT Department of Humanities and Social Sciences**Part of:** [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|-------------|----------|
| SS 2020 | 5011003 | Social Change and Social Policy | 2 SWS | Seminar (S) | Binder |
| SS 2020 | 5011008 | Sociology of Organizations | 2 SWS | Seminar (S) | Kauppert |
| SS 2020 | 5011013 | Economic Inequality | 2 SWS | Seminar (S) | Binder |
| SS 2020 | 5011019 | Sociology of Organizations | 2 SWS | Seminar (S) | Kauppert |
| WS 20/21 | 5011011 | Economic inequality | 2 SWS | Seminar (S) | Binder |
| WS 20/21 | 5011014 | Sociology of Technology | SWS | Seminar (S) | Lösch |

T

7.233 Course: Social Science B (WiWi) [T-GEISTSOZ-109049]

Responsible: Prof. Dr. Gerd Nollmann

Organisation: KIT Department of Humanities and Social Sciences

Part of: [M-GEISTSOZ-101167 - Sociology/Empirical Social Research](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------------|---------|
| Examination of another type | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|-------------|--------|
| WS 20/21 | 5011011 | Economic inequality | 2 SWS | Seminar (S) | Binder |
| WS 20/21 | 5011014 | Sociology of Technology | SWS | Seminar (S) | Lösch |

T

7.234 Course: Special Topics in Information Systems [T-WIWI-109940]

Responsible: Prof. Dr. Christof Weinhardt
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101434 - eBusiness and Service Management](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4,5 | Each term | 2 |

Competence Certificate

The assessment of this course is according to §4(2), 3 SPO in form of a written documentation, a presentation of the outcome of the conducted practical components and an active participation in class.

Please take into account that, beside the written documentation, also a practical component (such as a survey or an implementation of an application) is part of the course. Please examine the course description for the particular tasks.

The final mark is based on the graded and weighted attainments (such as the written documentation, presentation, practical work and an active participation in class).

Prerequisites

see below

Recommendation

None

Annotation

All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Systems course. The current topics of the practical seminars are available at the following homepage: www.iism.kit.edu/im/lehre.

The Special Topics Information Systems is equivalent to the practical seminar, as it was only offered for the major in "Information Systems" 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

7.235 Course: Statistical Modeling of Generalized Regression Models [T-WIWI-103065]

Responsible: apl. Prof. Dr. Wolf-Dieter Heller
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101599 - Statistics and Econometrics](#)
[M-WIWI-105414 - Statistics and Econometrics II](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|--------|
| WS 20/21 | 2521350 | Statistical Modeling of Generalized Regression Models | 2 SWS | Lecture (V) /  | Heller |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation.

Prerequisites

None

Recommendation

Knowledge of the contents covered by the course "Economics III: Introduction in Econometrics" [2520016]

Below you will find excerpts from events related to this course:

V

Statistical Modeling of Generalized Regression Models

2521350, WS 20/21, 2 SWS, [Open in study portal](#)

Lecture (V)
On-Site

Content

Learning objectives:

The student has profound knowledge of generalized regression models.

Requirements:

Knowledge of the contents covered by the course *Economics III: Introduction in Econometrics* [2520016].

Workload:

Total workload for 4.5 CP: approx. 135 hours

Attendance: 30 hours

Preparation and follow-up: 65 hours

T

7.236 Course: Statistics I [T-WIWI-102737]

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-100950 - Preliminary Exam](#)
[M-WIWI-101432 - Introduction to Statistics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|------------------------------|-------|-------------|--------|
| SS 2020 | 2600008 | Statistics I | 4 SWS | Lecture (V) | Grothe |

Competence Certificate

The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

Prerequisites

None

Below you will find excerpts from events related to this course:

V

Statistics I

2600008, SS 2020, 4 SWS, Language: German, [Open in study portal](#)

Lecture (V)**Content****Learning objectives:**

The Student understands and applies

- the basic concepts of statistical data exploration,
- the basic definitions and theorems of probability theory.

Content:

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities

C. Random variables: location and shape parameters, dependency measures, concrete distribution models

Workload:

Total workload for 5 CP: approx. 150 hours

Attendance: 60 hours

Preparation and follow-up: 90 hours

Literature

Skriptum: Kurzfassung Statistik I

Weiterführende Literatur:

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

**7.237 Course: Statistics II [T-WIWI-102738]**

Responsible: Prof. Dr. Oliver Grothe
Prof. Dr. Melanie Schienle

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-101432 - Introduction to Statistics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 5 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|-----------------|-------------|
| WS 20/21 | 2610020 | Statistics II | 4 SWS | Lecture (V) / | Grothe |
| WS 20/21 | 2610021 | | 2 SWS | Tutorial (Tu) / | Grothe, KIT |
| WS 20/21 | 2610022 | PC-Praktikum zu Statistik II | 2 SWS | / | Grothe, KIT |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation.

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

Prerequisites

None

Recommendation

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2610020].

Below you will find excerpts from events related to this course:

**Statistics II**

2610020, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
Online**

Content**Learning objectives:**

The student

- understands and applies the basic definitions and theorems of probability theory,
- transfers these theoretical foundations to problems in parametrical mathematical statistics.

Content:

D. Sampling and Estimation Theory: Sampling distributions, estimators, point and interval estimation

E. Test Theory: General Principles of Hypothesis Testing, Concrete 1- and 2-Sampling Tests

F. Regression analysis: Simple and multiple linear regression, statistical inference

Requirements:

It is recommended to attend the course *Statistics I* [2600008] before the course *Statistics II* [2600020].

Workload:

Total workload: 150 hours (5.0 Credits).

Attendance: 30 hours

Preparation and follow-up: 90 hours

Literature

Skriptum: Kurzfassung Statistik II

Weiterführende Literatur:

Bamberg, G., Baur, F. und Krapp, M.: Statistik, 15. überarb. Auflage. Oldenbourg, München 2009, ISBN 978-3486590883.

Fahrmeir, L., Heumann, C., Künstler, R., Pigeot, I. und Tutz, G.: Statistik - Der Weg zur Datenanalyse, 8. Auflage. Springer Spektrum. Berlin 2016, ISBN 978-3-662-50371-3.

Mosler, K. und Schmid, F.: Beschreibende Statistik und Wirtschaftsstatistik, 4. akt. und verb. Auflage, Springer, Berlin 2009, ISBN 978-3642015564.

Mosler, K. und Schmid, F.: Wahrscheinlichkeitsrechnung und schließende Statistik, 4. verb. Aufl., Springer, Berlin 2011, ISBN 978-3642150098.

Stock, J.H. und Watson M.W.: Introduction to Econometrics, 3. Auflage, Prentice Hall 2014, ISBN 978-1292071312

Stocker, T.C. und Steinke I.: Statistik: Grundlagen und Methodik. De Gruyter Oldenbourg, Berlin 2016 ISBN-13: 978-3110353884.

T

7.238 Course: Strategic Finance and Technoloy Change [T-WIWI-110511]

Responsible: Prof. Dr. Martin Ruckes
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101423 - Topics in Finance II](#)
[M-WIWI-101465 - Topics in Finance I](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 1,5 | Each summer term | 1 |

Competence Certificate

The assessment consists of a written exam (60 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation. The exam is offered each semester. If there are only a small number of participants registered for the exam, we reserve the right to hold an oral examination instead of a written one.

Prerequisites

None

Recommendation

Attending the lecture "Financial Management" is strongly recommended.

T

7.239 Course: Structural and Phase Analysis [T-MACH-102170]

Responsible: Dr. Manuel Hinterstein
Dr.-Ing. Susanne Wagner

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|---|-------|---|---------------------|
| WS 20/21 | 2125763 | Structural and phase analysis | 2 SWS | Lecture (V) /  | Wagner, Hinterstein |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Oral examination

Prerequisites

none

Below you will find excerpts from events related to this course:

V

Structural and phase analysis

2125763, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)
Blended (On-Site/Online)

Organizational issues

Die Vorlesung findet im Seminarraum am Fasanengarten (Geb. 50.35, R 101) oder online statt;
erster Termin: 03.11.2020

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

7.240 Course: Structural Ceramics [T-MACH-102179]

Responsible: Prof. Dr. Michael Hoffmann
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 4 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|-------------------------------------|-------|-------------|----------|
| SS 2020 | 2126775 | Structural Ceramics | 2 SWS | Lecture (V) | Hoffmann |

Competence Certificate
Oral examination, 20 min

Prerequisites
none

Below you will find excerpts from events related to this course:

V

Structural Ceramics

2126775, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Literature

W.D. Kingery, H.K. Bowen, D.R. Uhlmann, "Introduction to Ceramics", John Wiley & Sons, New York, (1976)

E. Dörre, H. Hübner, "Alumina", Springer Verlag Berlin, (1984)

M. Barsoum, "Fundamentals of Ceramics", McGraw-Hill Series in Material Science and Engineering (2003)

T

7.241 Course: Supplement Applied Informatics [T-WIWI-110711]

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101426 - Electives in Informatics](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------|---------|
| Written examination | 4,5 | Each term | 1 |

Competence Certificate

The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation. Depending on the particular course associated with this placeholder a bonus on the examination grade is possible.

Prerequisites

None

Annotation



This course can be used in particular for the acceptance of external courses whose content is in the broader area of applied informatics, but is not equivalent to another course of this topic.




T

7.242 Course: System Dynamics and Control Engineering [T-ETIT-101921]

Responsible: Prof. Dr.-Ing. Sören Hohmann
Organisation: KIT Department of Electrical Engineering and Information Technology
Part of: M-ETIT-101156 - Control Engineering

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 6 | Each winter term | 2 |

| Events | | | | | |
|----------|---------|--|-------|--|-----------|
| WS 20/21 | 2303155 | Systemdynamik und Regelungstechnik | 2 SWS | Lecture (V) /  | Hohmann |
| WS 20/21 | 2303156 | Tutorien zu 2303155 Systemdynamik und Regelungstechnik | SWS | Tutorial (Tu) | |
| WS 20/21 | 2303157 | Übungen zu 2303155 Systemdynamik und Regelungstechnik | 2 SWS | Practice (Ü) /  | Schneider |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Prerequisites

none

T

7.243 Course: Systematic Materials Selection [T-MACH-100531]

Responsible: Dr.-Ing. Stefan Dietrich
Prof. Dr.-Ing. Volker Schulze

Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101262 - Emphasis Materials Science](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4 | Each summer term | 4 |

| Events | | | | | |
|---------|---------|---|-------|--------------|-----------------------|
| SS 2020 | 2174576 | Systematic Materials Selection | 3 SWS | Lecture (V) | Dietrich |
| SS 2020 | 2174577 | Übungen zu 'Systematische Werkstoffauswahl' | 1 SWS | Practice (Ü) | Dietrich, Mitarbeiter |

Competence Certificate

The assessment is carried out as a written exam of 2 h.

Prerequisites

none

Recommendation

Basic knowledge in materials science, mechanics and mechanical design due to the lecture Materials Science I/II.

Below you will find excerpts from events related to this course:

V

Systematic Materials Selection

2174576, SS 2020, 3 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

Important aspects and criteria of materials selection are examined and guidelines for a systematic approach to materials selection are developed. 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

learning objectives:

The students are able to select the best material for a given application. They are proficient in selecting materials on base of performance indices and materials selection charts. They can identify conflicting objectives and find sound compromises. They are aware of the potential and the limits of hybrid material concepts (composites, bimaternal, foams) and can determine whether following such a concept yields a useful benefit.

requirements:

WiIng SPO 2007 (B.Sc.)

The course Material Science I [21760] has to be completed beforehand.

WiIng (M.Sc.)

The course Material Science I [21760] has to be completed beforehand.

workload:

The workload for the lecture is 120 h per semester and consists of the presence during the lecture (30 h) as well as preparation and rework time at home (30 h) and preparation time for the oral exam (60 h).

Literature

Vorlesungsskriptum; Übungsblätter; Lehrbuch: 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

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

7.244 Course: Systems of Remote Sensing, Prerequisite [T-BGU-101637]

Responsible: Prof. Dr.-Ing. Stefan Hinz
Dr.-Ing. Uwe Weidner

Organisation: KIT Department of Civil Engineering, Geo- and Environmental Sciences

Part of: [M-WIWI-104838 - Introduction to Natural Hazards and Risk Analysis](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 1 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|--------------|---------|
| SS 2020 | 6020242 | Fernerkundungssysteme, Übung | 1 SWS | Practice (Ü) | Weidner |

Prerequisites

None

Recommendation

None

Annotation

None

**7.245 Course: Tactical and Operational Supply Chain Management [T-WIWI-102714]**

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101413 - Applications of Operations Research](#)
[M-WIWI-101421 - Supply Chain Management](#)
[M-WIWI-103278 - Optimization under Uncertainty](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 4,5 | Each summer term | 3 |

| Events | | | | | |
|---------|---------|--|-------|--------------|--------|
| SS 2020 | 2550486 | Taktisches und operatives SCM | 2 SWS | Lecture (V) | Nickel |
| SS 2020 | 2550487 | Übungen zu Taktisches und operatives SCM | 1 SWS | Practice (Ü) | Dunke |

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:

**Taktisches und operatives SCM**

2550486, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

Content

The planning of material transport is an essential element of Supply Chain Management. By linking transport connections across different facilities, the material source (production plant) is connected with the material sink (customer). The general supply task can be formulated as follows (cf. Gudehus): For given material flows or shipments, choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. The main goal of the inventory management is the optimal determination of order quantities in terms of minimization of fixed and variable costs subject to resource constraints, supply availability and service level requirements. Similarly, the problem of lot sizing in production considers the determination of the optimal amount of products to be produced in a time slot. The course includes an introduction to basic terms and definitions of Supply Chain Management and a presentation of fundamental quantitative planning models for distribution, vehicle routing, inventory management and lot sizing. Furthermore, case studies from practice will be discussed in detail.

Literature**Weiterführende Literatur**

- Domschke: Logistik: Transporte, 5. Auflage, Oldenbourg, 2005
- Domschke: Logistik: Rundreisen und Touren, 4. Auflage, Oldenbourg, 1997
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
- Simchi-Levi, Kaminsky, Simchi-Levi: Designing and Managing the Supply Chain, 3rd edition, McGraw-Hill, 2008
- Silver, Pyke, Peterson: Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998

T

7.246 Course: Team Project Management and Technology [T-WIWI-110968]

Responsible: Prof. Dr. Martin Klarmann
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-105440 - Team Project Management and Technology](#)

| Type | Credits | Recurrence | Expansion | Version |
|-----------------------------|---------|------------|-----------|---------|
| Examination of another type | 9 | Each term | 1 terms | 1 |

| Events | | | | | |
|----------|---------|--|-----|---|------------------|
| WS 20/21 | 2500025 | Teamprojekt Wirtschaft und Technologie | SWS | Project (PRO) /  | Klarmann, Mädche |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

T


7.247 Course: Team Project Management and Technology (BUS/ENG) [T-WIWI-110977]





Responsible: Prof. Dr. Martin Klarmann
Prof. Dr. Alexander Mädche

Organisation: KIT Department of Economics and Management

Part of: [M-WIWI-105447 - Team Project Management and Technology \(BUS/ENG\)](#)

| Type | Credits | Recurrence | Expansion | Version |
|-----------------------------|---------|------------|-----------|---------|
| Examination of another type | 9 | Each term | 1 terms | 1 |

| Events | | | | | |
|----------|---------|--|-----|---|------------------|
| WS 20/21 | 2500025 | Teamprojekt Wirtschaft und Technologie | SWS | Project (PRO) /  | Klarmann, Mädche |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled

Competence Certificate

Alternative exam assessment. The basis for grading is the documents produced, the presentations during the course of the project, the artifact to be produced (e.g. algorithm, method, model, software, component) and the final presentation.

T

7.248 Course: Tires and Wheel Development for Passenger Cars [T-MACH-102207]

Responsible: Hon.-Prof. Dr. Günter Leister
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|--|-------|-------------|---------|
| SS 2020 | 2114845 | Tires and Wheel Development for Passenger Cars | 2 SWS | Lecture (V) | 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 2020, 2 SWS, [Open in study portal](#)

Lecture (V)

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 including Design and manufacturing methods, Wheeltesting
7. Tire pressure: Indirect and direct measuring systems
8. Tire testing subjective and objective

Learning Objectives:

The students are informed about the interactions of tires, wheels and chassis. They have an overview of the processes regarding the tire and wheel development. They have knowledge of the physical relationships.

Organizational issues

Voraussichtliche Termine, nähere Informationen und eventuelle Terminänderungen:

siehe Institutshomepage.

Literature

Manuskript zur Vorlesung


Manuscript to the lecture


T

7.249 Course: Tutorial Global Production [T-MACH-110981]

Responsible: Prof. Dr.-Ing. Gisela Lanza**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101284 - Specialization in Production Engineering](#)

| Type | Credits | Recurrence | Version |
|----------------------|---------|------------------|---------|
| Completed coursework | 1 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|--|-------|
| WS 20/21 | 2149611 | Tutorial Global Production | 1 SWS | Practice (Ü) /  | Lanza |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Alternative achievement (ungraded). Successful completion of the case studies required. Further information will be announced in the course Global Production.

Prerequisites

Global Production must be commenced.

Below you will find excerpts from events related to this course:

V

Tutorial Global Production2149611, WS 20/21, 1 SWS, Language: German, [Open in study portal](#)**Practice (Ü)
Online**

Content

The exercise serves as a supplement to the lecture Global Production and deals with the practical implementation of the management of global production networks of manufacturing companies. The contents conveyed in the lecture are put into practice in the exercise and supplemented by lectures from industry and research. The exercise initially builds on a basic understanding of the influencing factors and challenges of global production. Common methods and procedures for planning, designing and managing global production networks are applied in online case studies based on the restructuring of a fictitious company.

According to the lecture, the exercise is divided into three aspects: production strategy, network configuration and network management.

First of all, the exercise shows the connections between the company strategy and the production strategy and highlights the tasks necessary to define a production strategy. Subsequently, in the context of the design of global production networks, methods for site selection, site-specific adaptation of product design and production technology as well as for the establishment of a new production site and the adaptation of existing production networks to changing conditions are taught. With regard to the management of global production networks, the exercise primarily addresses the topic of procurement and supplier management in greater depth.

The topics in detail are:

- Production strategies for global production Networks
- From corporate strategy to production strategy
- Tasks of the production strategy (product portfolio management, recycling management, vertical integration planning, production-related research and development)
- Design of global production Networks
- Ideal-typical network structures
- Planning process for designing the network structure
- Adaptation of the network structure
- Choice of Location
- Production adjustment to suit the Location
- Management of global production Networks
- Coordination in global production Networks
- Procurement process

Learning Outcomes

The students ...

- are able to apply defined procedures for site selection and evaluate a site decision with the help of different Methods.
- are capable of selecting adequate design options for site-specific production and product design on a case-specific basis.
- can explain the central elements of the planning process when setting up a new production site.
- are capable of applying the methods for the design and layout of global production networks to individual Company problems.
- are able to show the challenges and potentials of the corporate divisions sales, procurement and research and development on a global level.

Workload:

e-Learning: ~ 20 h

regular attendance: ~ 10 h

self-study: covered in the course of the lecture.

Organizational issues

Übungstermine freitags 15:45 Uhr - 17:15 Uhr.

Bekanntgabe der konkreten Termine erfolgt über die Institutshomepage.

Die Teilnahme ist an eine Teilnahme der Veranstaltung Globale Produktion gekoppelt. Nur mit einer Teilnahme an der Vorlesung kann die Übung wahrgenommen werden.

Lecture dates on Fridays, 15:45 h - 17:15 h, exact dates will be announced on the Homepage of the institute.

Participation is linked to participation in the course Global Production and Logistics - Part 1: Global Production. Only with a participation in the lecture the exercise can be attended.

**7.250 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 - Handling Characteristics of Motor Vehicles](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each winter term | 1 |

| Events | | | | | |
|----------|---------|--|-------|---------------|----------|
| SS 2020 | 2114856 | Vehicle Ride Comfort & Acoustics I | 2 SWS | Lecture (V) | Gauterin |
| WS 20/21 | 2113806 | Vehicle Comfort and Acoustics I | 2 SWS | Lecture (V) / | Gauterin |

Legend: Online, Blended (On-Site/Online), On-Site, Cancelled

Competence Certificate

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites

Can not be combined with lecture T-MACH-102206

Below you will find excerpts from events related to this course:

**Vehicle Ride Comfort & Acoustics I**

2114856, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

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.

Learning Objectives:

The students know what noises and vibrations mean, how they are generated, and how they are perceived by human beings. They have knowledge about the requirements given by users and the public. They know which components of the vehicle are participating in which way on noise and vibration phenomenon and how they could be improved. They are ready to apply different tools and methods to analyze relations and to judge them. They are able to develop the chasis regarding driving comfort and acoustic under consideration of goal conflicts.

Organizational issues

Kann nicht mit der Veranstaltung [2113806] kombiniert werden.

Can not be combined with lecture [2113806]

Genauere Termine entnehmen Sie bitte der Institutshomepage.

Scheduled dates:

see homepage of the institute.

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

Das Skript wird zu jeder Vorlesung zur Verfügung gestellt

**Vehicle Comfort and Acoustics I**

2113806, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)
Online**

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 chassis 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.

Learning Objectives:

The students know what noises and vibrations mean, how they are generated, and how they are perceived by human beings. They have knowledge about the requirements given by users and the public. They know which components of the vehicle are participating in which way on noise and vibration phenomenon and how they could be improved. They are ready to apply different tools and methods to analyze relations and to judge them. They are able to develop the chassis regarding driving comfort and acoustic under consideration of goal conflicts.

Organizational issues

Kann nicht mit der Veranstaltung [2114856] kombiniert werden.

Can not be combined with lecture [2114856]

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

Das Skript wird zu jeder Vorlesung zur Verfügung gestellt

T

7.251 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 - Handling Characteristics of Motor Vehicles](#)

| Type | Credits | Recurrence | Version |
|------------------|---------|------------------|---------|
| Oral examination | 3 | Each summer term | 1 |

| Events | | | | | |
|---------|---------|---|-------|-------------|----------|
| SS 2020 | 2114825 | Vehicle Comfort and Acoustics II | 2 SWS | Lecture (V) | Gauterin |
| SS 2020 | 2114857 | Vehicle Ride Comfort & Acoustics II | 2 SWS | Lecture (V) | Gauterin |

Competence Certificate

Oral Examination

Duration: 30 up to 40 minutes

Auxiliary means: none

Prerequisites

Can not be combined with lecture T-MACH-102205

Below you will find excerpts from events related to this course:

V

Vehicle Comfort and Acoustics II

2114825, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students have knowledge about the noise and vibration properties of the chassis components and the drive train. They know what kind of noise and vibration phenomena do exist, what are the generation mechanisms behind, which components of the vehicle participate in which way and how could they be improved. They have knowledge in the subject area of noise emission of automobiles: Noise impact, legal requirements, sources and influencing parameters, component and system optimization, target conflicts and development methods. They are ready to analyze, to judge and to optimize the vehicle with its single components regarding acoustic and vibration phenomena. They are also able to contribute competently to the development of a vehicle regarding the noise emission.

Organizational issues

Kann nicht mit der Veranstaltung [2114857] kombiniert werden.

Can not be combined with lecture [2114857]

Literature

Das Skript wird zu jeder Vorlesung zur Verfügung gestellt.

**Vehicle Ride Comfort & Acoustics II**

2114857, SS 2020, 2 SWS, Language: English, [Open in study portal](#)

Lecture (V)

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

Learning Objectives:

The students have knowledge about the noise and vibration properties of the chassis components and the drive train. They know what kind of noise and vibration phenomena do exist, what are the generation mechanisms behind, which components of the vehicle participate in which way and how could they be improved. They have knowledge in the subject area of noise emission of automobiles: Noise impact, legal requirements, sources and influencing parameters, component and system optimization, target conflicts and development methods. They are ready to analyze, to judge and to optimize the vehicle with its single components regarding acoustic and vibration phenomena. They are also able to contribute competently to the development of a vehicle regarding the noise emission.

Organizational issues

Genauere Termine entnehmen Sie bitte der Institushomepage.

Kann nicht mit der Veranstaltung [2114825] kombiniert werden.

Scheduled dates:

see homepage of the institute.

Can not be combined with lecture [2114825].

Literature

Das Skript wird zu jeder Vorlesung zur Verfügung gestellt.

The script will be supplied in the lectures.

T

7.252 Course: Vehicle Mechatronics I [T-MACH-105156]

Responsible: Prof. Dr.-Ing. Dieter Ammon
Organisation: KIT Department of Mechanical Engineering

Part of: [M-MACH-101264 - Handling Characteristics of Motor Vehicles](#)
[M-MACH-101265 - Vehicle Development](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|------------------|---------|
| Written examination | 3 | Each winter term | 1 |

Competence Certificate

Written examination

Duration: 90 minutes

Auxiliary means: none

Prerequisites

none

T

7.253 Course: Virtual Reality Practical Course [T-MACH-102149]**Responsible:** Prof. Dr.-Ing. Jivka Ovtcharova**Organisation:** KIT Department of Mechanical Engineering**Part of:** [M-MACH-101270 - Product Lifecycle Management](#)

| Type | Credits | Recurrence | Version |
|-----------------------------|---------|------------|---------|
| Examination of another type | 4 | Each term | 2 |

| Events | | | | | |
|----------|---------|--|-------|---|-------------------------|
| WS 20/21 | 2123375 | Virtual Reality Practical Course | 3 SWS | Project (PRO) /  | Ovtcharova, Mitarbeiter |

Legend:  Online,  Blended (On-Site/Online),  On-Site,  Cancelled**Competence Certificate**

Assessment of another type (graded)

Prerequisites

None

Annotation

Number of participants is limited

Below you will find excerpts from events related to this course:

V

Virtual Reality Practical Course2123375, WS 20/21, 3 SWS, Language: German/English, [Open in study portal](#)**Project (PRO)
Blended (On-Site/Online)****Content**

- Introduction in Virtual Reality (hardware, software, applications)
- Exercises in the task specific software systems
- Autonomous project work in the area of Virtual Reality in small groups

Organizational issues

Siehe Homepage zur Lehrveranstaltung

Literature

Keine / None

T

7.254 Course: Welfare Economics [T-WIWI-102610]

Responsible: Prof. Dr. Clemens Puppe
Organisation: KIT Department of Economics and Management
Part of: [M-WIWI-101501 - Economic Theory](#)

| Type | Credits | Recurrence | Version |
|---------------------|---------|-----------------|---------|
| Written examination | 4,5 | see Annotations | 3 |

Competence Certificate

The examination takes the form of a written examination lasting 60 minutes at the end of the semester. The course is offered every two years. An examination takes place every summer semester.

Prerequisites

The course *Economics I: Microeconomics* [2610012] has to be completed beforehand.

Recommendation

None

Annotation

The course only takes place every second summer semester, the next course is planned for summer semester 2021.