Module Handbook
Information Engineering and Management B.Sc.
SPO 2015
Winter term 2020/21
Date: 14/09/2020
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1 Welcome to the new module handbook of your study programme

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

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

For modules and courses with INFO-Id:

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D-76133 Karlsruhe
https://www.wiwi.kit.edu/
2 About this handbook

2.1 Notes and rules

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

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

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

2.1.1 Begin and completion of a module

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

2.1.2 Module versions

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

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

2.1.3 General and partial examinations

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

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

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

2.1.4 Types of exams

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

2.1.5 Repeating exams

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

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

2.1.6 Examiners

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

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

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

2.1.8 Additional accomplishments

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

2.1.9 Further information

More detailed information about the legal and general conditions of the program can be found in the examination regulation of the program (http://www.sle.kit.edu/amtlicheBekanntmachungen.php).
3 The Bachelor’s degree program in Information Engineering and Management

3.1 Qualification objectives of the Bachelor’s degree in Information Engineering and Management

Graduates with a Bachelor’s degree in Information Engineering and Management are equipped with strategically oriented basic knowledge in the fields of informatics (theoretical computer science, algorithms, programming technology and software engineering), economic sciences (business-related topics from the financial industry, information industry, production management, marketing and accounting as well as economic correlations of microeconomics) and law (basics of private law, private business law and of the constitutional and administrative law) as well as mathematics, statistics and operation research.

Through the comprehensive methodological basis, the graduates are in a position to acknowledge and apply specialized basic concepts, methods, models and approaches.

The graduates have an in-depth knowledge in computer science and law.

They can acknowledge, describe and communicate economic, IT and legal problems. This hereby entails planning, analyzing, comparing, reviewing and optimizing products, systems and processes. They make decisions, develop specialized solutions and implement their innovative ideas using methods and models from different disciplines within the framework of the available resources. They know how to illustrate, validate, review and guarantee the quality of the results achieved.

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

Through the interdisciplinary nature of the course, the graduates can effectively respond at the interface of the different topics as well as set up targeted communication between the respective disciplines.

The graduates are in a position to work in a team and cope with challenges, e.g., those encountered in information and communication technology fields.

They have the ability to exercise career-related activities in the industry, service sector or in trade, start their own firms or take up a Master’s degree program in Information Engineering and Management or any other related course.

3.2 Structure of the Bachelor’s degree program in Information Engineering and Management

SPO 2015

The Bachelor’s degree program in Information Engineering and Management SPO 2015 has 6 terms. The first four terms have a methodological orientation and provides the student with the foundations of informatics, business administration, economics and law. Terms 5 and 6 aim at the specialization and application of this knowledge. Figure 2 shows the structure of the subjects and the credits (CP) allocated to the subjects.

According to the European Credit Transfer System, one credit corresponds to a workload of 30 hours.

<table>
<thead>
<tr>
<th>Term</th>
<th>Credits</th>
<th>Informatics</th>
<th>Business Administration</th>
<th>Economics</th>
<th>Operations Research</th>
<th>Statistics</th>
<th>Mathematics</th>
<th>Law</th>
<th>Internship</th>
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</thead>
<tbody>
<tr>
<td>1 (WT)</td>
<td>32</td>
<td>Foundations in Informatics 6 CP</td>
<td>Programming 5 CP</td>
<td></td>
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<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2 (ST)</td>
<td>30.5</td>
<td>Algorithms 1 6 CP</td>
<td>Theor. Informatics 6 CP</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 (WT)</td>
<td>29.5</td>
<td>Applied Informatics 8 CP</td>
<td>BUS 8 CP</td>
<td></td>
<td>OR 9 CP</td>
<td>STAT 30 CP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 (ST)</td>
<td>28</td>
<td>Software Engineering 1 6 CP</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Term</th>
<th>Credits</th>
<th>Advanced Studies in Informatics</th>
<th>Advanced Studies in Economics and Management</th>
<th>Advanced Studies in Law</th>
<th>Research Course</th>
<th>Bachelor Thesis</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 (WT)</td>
<td>27</td>
<td>Modules 18 CP</td>
<td>BUS-Module 9 CP</td>
<td>Module 9 CP</td>
<td>2 Seminars 3 CP + 3 CP</td>
<td>Bachelor Thesis 12 CP</td>
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<td>6 (ST)</td>
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<td>Module 6 CP</td>
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Information Engineering and Management B.Sc.
Module Handbook as of 14/09/2020
Based on a solid mathematical education, the modules of the first four terms of the Bachelor programme in information engineering and management are allocated in the proportion 40/40/20 to informatics (informatics, applied informatics, and computer engineering), economic sciences (business administration, economics, operations research), and law. The internship prepares the student for his profession. Figure 3 shows the allocation of courses to modules and the curriculum for the first four terms.

### Figure 3: Curriculum in the terms 1-4

<table>
<thead>
<tr>
<th>ModulID</th>
<th>Course</th>
<th>Hours per week</th>
<th>CP</th>
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</thead>
<tbody>
<tr>
<td><strong>1st Term</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-WIWI-101491</td>
<td>Business Administration: Finance and Accounting</td>
<td>2/0/2</td>
<td>4.0</td>
</tr>
<tr>
<td>M-WIWI-101431</td>
<td>Economics I</td>
<td>3/0/2</td>
<td>5.0</td>
</tr>
<tr>
<td>M-MATH-101311</td>
<td>Mathematics I</td>
<td>4/2/2</td>
<td>8.0</td>
</tr>
<tr>
<td>M-INFO-101170</td>
<td>Basic Notions of Computer Science</td>
<td>3/1/3</td>
<td>6.0</td>
</tr>
<tr>
<td>M-INFO-101174</td>
<td>Programming</td>
<td>2/0/2</td>
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</tr>
<tr>
<td>M-INFO-101190</td>
<td>Civil Law for Beginners</td>
<td>4/0</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>32.0</td>
<td></td>
</tr>
<tr>
<td><strong>2nd Term</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>M-WIWI-101491</td>
<td>Introduction to Information Engineering and Management</td>
<td>2/0/2</td>
<td>4.0</td>
</tr>
<tr>
<td>M-WIWI-101432</td>
<td>Statistics I</td>
<td>4/0/2</td>
<td>5.0</td>
</tr>
<tr>
<td>M-WIWI-101418</td>
<td>Introduction to Operations Research I</td>
<td>2/2/2</td>
<td>4.5</td>
</tr>
<tr>
<td>M-MATH-101312</td>
<td>Mathematics II</td>
<td>4/2/2</td>
<td>8.0</td>
</tr>
<tr>
<td>M-INFO-100030</td>
<td>Algorithms I</td>
<td>3/1/2</td>
<td>6.0</td>
</tr>
<tr>
<td>M-INFO-101191</td>
<td>Advanced Civil Law</td>
<td>2/0</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>30.5</td>
<td></td>
</tr>
<tr>
<td><strong>3rd Term</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>M-WIWI-101492</td>
<td>Financial Accounting and Cost Accounting</td>
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</tr>
<tr>
<td>M-WIWI-101432</td>
<td>Statistics II</td>
<td>4/0/2</td>
<td>5.0</td>
</tr>
<tr>
<td>M-WIWI-101418</td>
<td>Introduction to Operations Research II</td>
<td>2/2/2</td>
<td>4.5</td>
</tr>
<tr>
<td>M-INFO-101189</td>
<td>Theoretical Foundation of Computer Science</td>
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<tr>
<td>M-INFO-101191</td>
<td>Commercial and Corporate Law</td>
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<td>3.0</td>
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<tr>
<td>M-INFO-101192</td>
<td>Public Law I</td>
<td>2/0</td>
<td>3.0</td>
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<tr>
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<td></td>
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<tr>
<td><strong>4th Term</strong></td>
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<tr>
<td>M-WIWI-101492</td>
<td>Business Administration: Production Economics and Marketing</td>
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<tr>
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<td>Applied Informatics II</td>
<td>2/1/1</td>
<td>4.0</td>
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<tr>
<td>M-INFO-101175</td>
<td>Software Engineering I</td>
<td>3/1/2</td>
<td>6.0</td>
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<td>M-INFO-101192</td>
<td>Public Law II</td>
<td>2/0</td>
<td>3.0</td>
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<td>M-INFO-101191</td>
<td>Exercises in Civil Law</td>
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<td>3.0</td>
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<tr>
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<tr>
<td></td>
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</tbody>
</table>

In the 3rd year (5th and 6th term) of the Bachelor program the student must pass:

- module(s) with 18 credits in informatics
- a module with 9 credits in the subject Business Administration
- a module with 9 credits in the subject BA/OR/EC,
- a module with 6 credits in law,

Figure 2: Structure of Bachelor's degree program in Information Engineering and Management SPO2015 (recommendation)
• two out of the three seminar modules with 3 credits each,
• and the bachelor thesis with 12 credits.
### 4 Field of study structure

#### Mandatory

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
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<tbody>
<tr>
<td>Orientation Exam</td>
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<tr>
<td>Bachelor Thesis</td>
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<tr>
<td>Internship</td>
<td>8 CR</td>
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<td>Business Administration</td>
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<td>Informatics</td>
<td>37 CR</td>
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<tr>
<td>Mathematics</td>
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<td>Operations Research</td>
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<tr>
<td>Statistics</td>
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<td>Law</td>
<td>19 CR</td>
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<td>Advanced Studies in Economics and Management</td>
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<td>6 CR</td>
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<td>Research Course</td>
<td>6 CR</td>
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#### 4.1 Orientation Exam

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<tr>
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#### 4.2 Bachelor Thesis

<table>
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<tr>
<td>M-WIWI-101611 Module Bachelor Thesis</td>
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#### 4.3 Internship

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<thead>
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<tr>
<td>M-WIWI-101433 Internship</td>
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#### 4.4 Business Administration

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>M-WIWI-101491 Foundations in Business Administration</td>
<td>8 CR</td>
</tr>
<tr>
<td>M-WIWI-101492 Business Administration</td>
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### 4.5 Economics

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<tr>
<td>M-WIWI-101431 Economics</td>
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### 4.6 Informatics

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<tr>
<td>M/INFO-101170 Basic Notions of Computer Science</td>
<td>6 CR</td>
</tr>
<tr>
<td>M/INFO-101174 Programming</td>
<td>5 CR</td>
</tr>
<tr>
<td>M/INFO-100030 Algorithms I</td>
<td>6 CR</td>
</tr>
<tr>
<td>M-WIWI-101430 Applied Informatics</td>
<td>8 CR</td>
</tr>
<tr>
<td>M/INFO-101189 Theoretical Informatics</td>
<td>6 CR</td>
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<tr>
<td>M/INFO-101175 Software Engineering I</td>
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### 4.7 Mathematics

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<tr>
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<tbody>
<tr>
<td>M-MATH-101311 Mathematics I</td>
<td>8 CR</td>
</tr>
<tr>
<td>M-MATH-101312 Mathematics II</td>
<td>8 CR</td>
</tr>
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### 4.8 Operations Research

<table>
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</thead>
<tbody>
<tr>
<td>M-WIWI-101418 Introduction to Operations Research</td>
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### 4.9 Statistics

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<tr>
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<tr>
<td>M-WIWI-101432 Introduction to Statistics</td>
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### 4.10 Law

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<tr>
<td>M/INFO-101190 Introduction to Civil Law</td>
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<tr>
<td>M/INFO-101191 Commercial Law</td>
<td>9 CR</td>
</tr>
<tr>
<td>M/INFO-101192 Constitutional and Administrative Law</td>
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**Prerequisites**

XXX
### 4.11 Advanced Studies in Informatics

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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</thead>
<tbody>
<tr>
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<td>Semantic Knowledge Management</td>
<td>9 CR</td>
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<tr>
<td>M-WIWI-101440</td>
<td>Information Services in Networks</td>
<td>9 CR</td>
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<tr>
<td>M-WIWI-101476</td>
<td>Business Processes and Information Systems</td>
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<tr>
<td>M-INFO-100809</td>
<td>Advanced Object Orientation</td>
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<tr>
<td>M-INFO-100818</td>
<td>Computer Architecture</td>
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<td>M-INFO-100833</td>
<td>Software Engineering II</td>
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<td>M-INFO-100834</td>
<td>Security</td>
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<tr>
<td>M-INFO-101173</td>
<td>Algorithms II</td>
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</tr>
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<td>M-INFO-101193</td>
<td>Foundations of Information Systems</td>
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</tr>
<tr>
<td>M-INFO-101194</td>
<td>Telematics</td>
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<td>M-INFO-101220</td>
<td>Algorithms for Planar Graphs</td>
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<tr>
<td>M-INFO-101229</td>
<td>Database Systems in Theory and Practice</td>
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<tr>
<td>M-INFO-101235</td>
<td>Introduction to Data and Information Management</td>
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<td>M-INFO-101237</td>
<td>Algorithmic Methods for Hard Optimization Problems</td>
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<td>M-INFO-101249</td>
<td>Mobile Computing and Internet of Things</td>
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<td>Mobile Robots – Practical Course</td>
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<td>Lego Mindstorms - Practical Course</td>
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<td>M-INFO-102978</td>
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<tr>
<td>M-WIWI-104069</td>
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4.12 Advanced Studies in Economics and Management

<table>
<thead>
<tr>
<th>Election block: Elective Modules in Business Administration (1 item)</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-WIWI-101434 eBusiness and Service Management</td>
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</tr>
<tr>
<td>M-WIWI-101421 Supply Chain Management</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101402 eFinance</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101425 Strategy and Organization</td>
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</tr>
<tr>
<td>M-WIWI-101437 Industrial Production I</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101464 Energy Economics</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101435 Essentials of Finance</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101465 Topics in Finance I</td>
<td>9 CR</td>
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<tr>
<td>M-WIWI-101467 Design, Construction and Sustainability Assessment of Buildings</td>
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<tr>
<td>M-WIWI-101466 Real Estate Management</td>
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</tr>
<tr>
<td>M-WIWI-101424 Foundations of Marketing</td>
<td>9 CR</td>
</tr>
<tr>
<td>M-WIWI-101513 Human Resources and Organizations</td>
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<tr>
<td>M-WIWI-102752 Fundamentals of Digital Service Systems</td>
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<tr>
<td>M-WIWI-101423 Topics in Finance II</td>
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Election block: Elective Modules in Economics and Management (1 item)

| M-WIWI-101402 eFinance                                        | 9 CR    |
| M-WIWI-101421 Supply Chain Management                          | 9 CR    |
| M-WIWI-101424 Foundations of Marketing                         | 9 CR    |
| M-WIWI-101425 Strategy and Organization                        | 9 CR    |
| M-WIWI-101434 eBusiness and Service Management                | 9 CR    |
| M-WIWI-101435 Essentials of Finance                           | 9 CR    |
| M-WIWI-101464 Energy Economics                                 | 9 CR    |
| M-WIWI-101465 Topics in Finance I                             | 9 CR    |
| M-WIWI-101466 Real Estate Management                           | 9 CR    |
| M-WIWI-101467 Design, Construction and Sustainability Assessment of Buildings | 9 CR    |
| M-WIWI-101413 Applications of Operations Research              | 9 CR    |
| M-WIWI-101499 Applied Microeconomics                           | 9 CR    |
| M-WIWI-101501 Economic Theory                                  | 9 CR    |
| M-WIWI-101513 Human Resources and Organizations                | 9 CR    |
| M-WIWI-101599 Statistics and Econometrics                      | 9 CR    |
| M-WIWI-101936 Methodical Foundations of OR                     | 9 CR    |
| M-WIWI-102752 Fundamentals of Digital Service Systems          | 9 CR    |
| M-WIWI-103337 Optimization under Uncertainty                    | 9 CR    |
| M-WIWI-101403 Public Finance                                   | 9 CR    |
| M-WIWI-101423 Topics in Finance II                            | 9 CR    |
| M-WIWI-101668 Economic Policy I                                | 9 CR    |

4.13 Advanced Studies in Law

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### 4.14 Research Course

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**Election block: Research Courses Choose (2 out of 3 Modules) (2 items)**

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<td>Seminar Module Law</td>
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<td>M-INFO-102058</td>
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<td>3 CR</td>
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</table>
## 5.1 Module: Advanced Object Orientation [M-INFO-100809]

### Responsible:
Prof. Dr.-Ing. Gregor Snelting

### Organisation:
KIT Department of Informatics

### Part of:
Advanced Studies in Informatics

<table>
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### Mandatory

| T-INFO-101346 | Advanced Object Orientation | 5 CR | Snelting |

### Content
- Behaviour and semantics of dynamic dispatch
- Implementation of single and multiple inheritance
- Genericity, refactoring
- Traits and mixins, virtual classes
- Cardelli's type system
- Analyses on the call graph, points-to analyses
- Operational semantics, type safety
- Bytecode JVM, bytecode verifier, dynamic compilation

### Annotation
This is not a lecture on object-oriented software development! Rather, knowledge of object-oriented software engineering (e.g. Java, UML, Design Patterns) is required.
5.2 Module: Algorithmic Methods for Hard Optimization Problems [M-INFO-101237]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

<table>
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**Mandatory**

| T-INFO-103334 | Algorithmic Methods for Hard Optimization Problems | 5 CR | Wagner |

**Competence Goal**
The goal of this course is to familiarize the students with hard problems and possible approaches to solve them. Online problems may also be part of the course.

**Content**
There are many practical problems that cannot be solved optimally - some not at all and some not in a reasonable amount of time. An example is the “bin packing problem” where a collection of objects must be packed using a possibly small number of bins. Moreover, problems sometimes arise where knowledge about the future (or even about the present) is incomplete, but a decision is required nevertheless (“online problems”). Regarding bin packing, for example, there must be a point in time when you close the bins and send them away. Even if there are some more objects arriving later.
5.3 Module: Algorithms for Planar Graphs [M-INFO-101220]

Responsible: Prof. Dr. Dorothea Wagner
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

<table>
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Mandatory

| T-INFO-101986 | Algorithms for Planar Graphs | 5 CR | Wagner |

Content

A planar graph is defined as a graph that can be drawn in the plane such that no edges intersect. Planar graphs have many interesting properties that can be used to solve several problems in a particularly simple, fast and elegant way. In addition, some problems that are (NP-)hard in general graphs can be efficiently solved in planar graphs. The lecture presents a selection of these problems and corresponding algorithmic approaches.

Annotation

The module is offered irregularly.

Workload

approx. 150 h
## 5.4 Module: Algorithms I [M-INFO-100030]

**Responsible:** Prof. Dr. Peter Sanders  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics

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<th>6 CR</th>
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5.5 Module: Algorithms II [M-INFO-101173]

**Responsible:**
Prof. Dr. Hartmut Prautzsch
Prof. Dr. Peter Sanders
Prof. Dr. Dorothea Wagner

**Organisation:**
KIT Department of Informatics

**Part of:**
Advanced Studies in Informatics

<table>
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</table>
5.6 Module: Applications of Operations Research [M-WIWI-101413]

**Responsible:** Prof. Dr. Stefan Nickel

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

**Part of:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

<table>
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**Election block: Compulsory Elective Courses (between 1 and 2 items)**

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<td>4.5 CR</td>
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<td>T-WIWI-102714</td>
<td>Tactical and Operational Supply Chain Management</td>
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**Election block: Supplementary Courses (at most 1 item)**

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<td>T-WIWI-102726</td>
<td>Global Optimization I</td>
<td>4.5 CR</td>
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<td>T-WIWI-106199</td>
<td>Modeling and OR-Software: Introduction</td>
<td>4.5 CR</td>
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<td>Optimization under Uncertainty</td>
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**Compentence 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.

**Compentence 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.
5.7 Module: Applied Informatics [M-WIWI-101430]

Responsible: Prof. Dr. Andreas Oberweis  
Prof. Dr. Ali Sunyaev

Organisation: KIT Department of Economics and Management

Part of: Informatics

Credits: 8  
Recurrence: Each term  
Duration: 2 semester  
Language: German  
Level: 1  
Version: 3

Mandatory

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<td>Applied Informatics – Modelling</td>
<td>4 CR</td>
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</table>

Competence Certificate

The learning control for both courses takes the form of a written examination (60 minutes) in accordance with § 4(2), 1 SPO. The module grade consists of the credit-weighted average of the grades for both courses.

Competence Goal

The student should:

- Becomes familiar with relevant modelling languages for describing application domains and aspects of early software system design.
- Gains insight into methods and systems of computer science for the design and development of distributed information systems (supporting electronic business),
- is able to select, design, and apply these methods and systems in a way that is appropriate for the application context.

Prerequisites

None.

Content

The course Applied Informatics - Modelling [2511030] mainly addresses the early phases of the development of database-supported information systems, distributed systems for information services, intelligent systems and software systems in general. Main topics are modelling concepts and languages for describing application domains as well as static and dynamic aspects of early software system design. The course addresses in detail the following approaches: Entity-Relationship model, advanced aspects of UML, description logic, relational model, Petri nets, and event-driven process chains.

The course Applied Informatics - Internet Computing [2511032] 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

Recommendation

Knowledge of the module Basic Notions of Computer Science as well as Algorithms I is expected.

Workload

See german version.
Module: Applied Microeconomics [M-WIWI-101499]

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

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Election block: Compulsory Elective Courses (at least 9 credits)

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<td>Economics and Behavior</td>
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<td>Public Revenues</td>
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<td>Economics III: Introduction in Econometrics</td>
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<td>Competition in Networks</td>
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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
None.

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
# 5.9 Module: Basic Notions of Computer Science [M-INFO-101170]

**Responsible:** Dr. Sebastian Stüker  
Thomas Worsch  

**Organisation:** KIT Department of Informatics  

**Part of:** Informatics

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<td>Basic Notions of Computer Science Pass</td>
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<td>Stüker, Worsch</td>
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<td>T-INFO-101964</td>
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<td>6 CR</td>
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</table>

**Competence Goal**

- Students know the most important techniques for definitions and are able to read and understand such definitions.
- Students know the difference between syntax and semantics.
- Students know the most important notions from discrete mathematics and computer science and are able to use them for the description of problems and in proofs.

**Content**

- informal notion of algorithm, basics of correctness proofs
- computational complexity measures, hard problems
- big O notation, master theorem
- alphabets, words, formal languages
- finite acceptors, contextfree grammars
- inductive/recursive definitions, proofs by induction, closure
- relations and functions
- graphs

**Workload**

180 h
5.10 Module: Business Administration [M-WIWI-101492]

Responsible: Prof. Dr. Marliese Uhrig-Homburg
Prof. Dr. Christof Weinhardt

Organisation: KIT Department of Economics and Management

Part of: Business Administration

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<td>Financial Accounting and Cost Accounting</td>
<td>4 CR</td>
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Competence Certificate
The assessments of the courses are written examinations (90 minutes each) according to §4(2), 1 of the examination regulation. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Competence Goal
The student should be able to

- deal with advanced topics in accounting,
- describe the impacts and features of marketing instruments,
- knows the problem formulation and theories of production management, including the areas of energy, construction, real-estate and ergonomics,
- evaluate information as a competitive factor and is in control of the terminology and the methods to asses information.

Prerequisites
None

Content
The institutional framework and the modelling and formal description of a company's decisions play an essential role in this module. This module contains problems in procurement and materials management as well as in logistics. Modern production processes for goods and services are systematically presented. Marketing research and knowledge of the range of marketing instruments are fundamental for decisions in a competitive market environment. Advanced topics in accounting are also taught.

Recommendation
It is highly recommended to fulfil this module only after completing the module Foundations in Business Administration.

Workload
See German version.
5.11 Module: Business Processes and Information Systems [M-WIWI-101476]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Informatics

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

Election block: Compulsory Elective Courses (between 1 and 2 items)

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<td>T-WIWI-109799</td>
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Election block: Supplementary Courses (between 0 and 1 items)

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<td>Foundations of Mobile Business</td>
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<td>T-WIWI-110541</td>
<td>Advanced Lab Informatics (Master)</td>
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Competence Certificate
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

Competence Goal
Students
- design architecture models of enterprise information systems and compare alternative designs,
- explain the concepts and principles of process modeling languages and methods, apply the methods in a concrete situation and evaluate the results,
- choose an appropriate modeling language according to a given context for analysing, modeling and improving business processes.

Prerequisites
At least one of the courses "Business Process Modelling" or "Process Mining" has to be attended.

Content
Modeling the relevant aspects of a business process is the basis for efficient and effective support of this process in an enterprise information system. Detailed knowledge of languages, methods and software tools for supporting business process modeling is taught in this module.

Additionally fundamentals of software quality management are considered in this module. Maturity models like CMMI or SPICE for evaluation and improvement of a software development process are introduced.
Module: Commercial Law [M-INFO-101191]

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

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<td>Exercises in Civil Law</td>
<td>9 CR</td>
<td>Dreier, Matz</td>
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</table>
5.13 Module: Communication and Database Systems [M-INFO-101178]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

**Credits** 8  
**Recurrence** Each summer term  
**Duration** 1 semester  
**Language** German  
**Level** 3  
**Version** 1

**Mandatory**

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<td>T-INFO-102015</td>
<td>Introduction in Computer Networks</td>
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**Competence Goal**

The students will:

- have learned fundamentals of data communication as well as the design of communication systems,
- be familiar with the composition of the different protocols and their mechanisms and be able to design simple protocols on their own,
- have understood the relationships between the different communication layers,
- be able to explain the benefits of database technology at the end of the course,
- have understood the development of database applications and be able to set up and access simple databases,
- be familiar with the terminology and the underlying database theory.

**Content**

Distributed information systems are worldwide information repositories which are accessible by everybody at any place of the world at any time. The physical distance is bridged by telecommunication systems, while database management technology manages and coordinates data for arbitrary periods of time. In order to understand globally running processes, one has to understand both data transmission techniques and database technology. Besides the telecommunication and database technologies on their own, an understanding of their cooperation is required, too.

**Workload**

approx. 240 h
Module: Computer Architecture [M-INFO-100818]

**Responsible:** Prof. Dr.-Ing. Jörg Henkel  
Prof. Dr. Wolfgang Karl

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

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## 5.15 Module: Computer Engineering [M-INFO-101836]

**Responsible:** Prof. Dr. Wolfgang Karl  
**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

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

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

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### Mandatory

| T-INFO-110300 | Public Law I & II | 6 CR | Eichenhofer |

**Workload**  
See German version.
### 5.17 Module: Database Systems in Theory and Practice [M-INFO-101229]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

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**Election block:** Database Systems in Theory and Practice (at least 1 item as well as at least 5 credits)

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<tr>
<td>T-INFO-101305</td>
<td>Big Data Analytics</td>
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**Workload**

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

Responsible: Prof. Dr.-Ing. Thomas Lützkendorf
Organisation: KIT Department of Economics and Management

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<td>Design, Construction and Sustainability Assessment of Buildings I</td>
<td>4,5 CR</td>
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<td>T-WIWI-102743</td>
<td>Design, Construction and Sustainability Assessment of Buildings II</td>
<td>4,5 CR</td>
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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.
5.19 Module: Digital Circuits Design [M/INFO-102978]

Responsible: Prof. Dr.-Ing. Uwe Hanebeck
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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

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

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

**Part of:** Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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<td>T-WIWI-109938</td>
<td>Digital Services</td>
<td>4.5 CR</td>
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<td>T-WIWI-110797</td>
<td>eFinance: Information Systems for Securities Trading</td>
<td>4.5 CR</td>
<td>Weinhardt</td>
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<td>T-WIWI-109816</td>
<td>Foundations of Interactive Systems</td>
<td>4.5 CR</td>
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<td>T-WIWI-109936</td>
<td>Platform Economy</td>
<td>4.5 CR</td>
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<td>T-WIWI-109940</td>
<td>Special Topics in Information Systems</td>
<td>4.5 CR</td>
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**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.
5.21 Module: Economic Policy I [M-WIWI-101668]

**Responsible:** Prof. Dr. Ingrid Ott

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

**Part of:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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<td>Basic Principles of Economic Policy</td>
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**Election block: Compulsory Elective Courses (1 item)**

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<td>T-WIWI-109121</td>
<td>Macroeconomic Theory</td>
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<td>T-WIWI-102739</td>
<td>Public Revenues</td>
<td>4.5</td>
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<td>T-WIWI-102908</td>
<td>Personnel Policies and Labor Market Institutions</td>
<td>4.5</td>
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<td>T-WIWI-100005</td>
<td>Competition in Networks</td>
<td>4.5</td>
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**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.
5.22 Module: Economic Theory [M-WIWI-101501]

**Responsible:** Prof. Dr. Clemens Puppe

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

**Part of:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**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.
**5.23 Module: Economics [M-WIWI-101431]**

**Responsible:** Prof. Dr. Clemens Puppe  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Economics

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**Mandatory**  
T-WIWI-102708 | Economics I: Microeconomics | 5 CR | Puppe, Reiß

**Competence Certificate**  
The assessment of the module is a written examination according to §4(2), 1 of the examination regulation. The grade of the module corresponds to the grade of this examination.

The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. 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.

**Competence Goal**  
It is the main aim of this module 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.

**Prerequisites**  
None

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

**Annotation**  
When personal resources are available students' tutorials will be established.

**Workload**  
See German version.
5.24 Module: eFinance [M-WIWI-101402]

**Responsible:** Prof. Dr. Christof Weinhardt  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Advanced Studies in Economics and Management (Elective Modules in Business Administration)  
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Election block: Supplementary Courses (at least 4.5 credits)**

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<td>T-WIWI-102646</td>
<td>International Finance</td>
<td>3 CR Uhrig-Homburg</td>
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**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 criticise 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 assessment of options. Exchanges and International Finance are also alternatives which provide a suplementary 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.lism.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.
### 5.25 Module: Energy Economics [M-WIWI-101464]

**Responsible:** Prof. Dr. Wolf Fichtner  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Advanced Studies in Economics and Management (Elective Modules in Business Administration)  
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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<th>Language</th>
<th>Level</th>
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**Mandatory**

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<th>Credits</th>
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<tbody>
<tr>
<td>T-WIWI-102746</td>
<td>Introduction to Energy Economics</td>
<td>5.5 CR</td>
<td>Fichtner</td>
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</table>

**Election block: Supplementary Courses (3.5 credits)**

<table>
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<tr>
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<tr>
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<td>Energy Policy</td>
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<tr>
<td>T-WIWI-100806</td>
<td>Renewable Energy-Resources, Technologies and Economics</td>
<td>3.5 CR</td>
<td>Jochem</td>
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### 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 to 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 to 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.
### 5.26 Module: Essentials of Finance [M-WIWI-101435]

<table>
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<tr>
<th>Responsible:</th>
<th>Prof. Dr. Martin Ruckes</th>
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<td></td>
<td>Prof. Dr. Marliese Uhrig-Homburg</td>
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**Credits**: 9  
**Recurrence**: Each summer term  
**Duration**: 1 semester  
**Language**: German  
**Level**: 3  
**Version**: 2

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<td>T-WIWI-102604</td>
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**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.
**5.27 Module: Foundations in Business Administration [M-WIWI-101491]**

**Responsible:** Prof. Dr. Marliese Uhrig-Homburg  
Prof. Dr. Christof Weinhardt

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

**Part of:** Business Administration

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<td>T-WIWI-102819</td>
<td>Business Administration: Finance and Accounting</td>
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<tr>
<td>T-WIWI-102757</td>
<td>Introduction to Information Engineering and Management</td>
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**Competence Certificate**

The assessment is carried out as partial exams (according to §4(2), 1-3 of the examination regulation) of the single 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**

The objectives of this module are that the student is capable of dealing with issues in finance, investments, accounting and information engineering and management.

**Prerequisites**

None

**Content**

The institutional framework and the modelling and formal description of a company's decisions play an essential role in this module. The basic idea and the foundations of static and dynamic investment rules are presented and applied to problems in procurement and materials management as well as in logistics. Modern production processes for goods and services are systematically presented. Marketing research and knowledge of the range of marketing instruments are fundamental for decisions in a competitive market environment. The foundations of corporate finance are treated with a strong emphasis of the links to the capital market. Investment rules and corporate finance are instrumental for answering questions of source and application of funds, comparable to the lending and deposit business in banking; also an introduction to financial and management accounting is provided. The organisation of company and the problems of management and control constitute an other important aspect of business administration and management science. Finally, the process of value creation and distribution as well as the principles of the taxation of a company are treated with an emphasis on the analysis of the profit and loss statement.

Two case studies, namely the foundation of an innovative information service company and the process chain of a B2B direct marketing company from the customer to the producer, focus on the interdisciplinary links between legal framework, advanced information technology, and the resulting design options for business processes.

**Workload**

See German version.
Module: Foundations of Information Systems [M-INFO-101193]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

<table>
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**Election block: Foundations of Information Systems (at least 1 item as well as at least 4 credits)**

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<td>Selling IT-Solutions Professionally</td>
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<td>T-INFO-101975</td>
<td>Consulting in Practice</td>
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<td>T-INFO-101976</td>
<td>Project Management in Practice</td>
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<td>T-INFO-103552</td>
<td>Lab: Working with Database Systems</td>
<td>4 CR</td>
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<td>T-INFO-105742</td>
<td>Big Data Analytics 2</td>
<td>3 CR</td>
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<td>T-INFO-101305</td>
<td>Big Data Analytics</td>
<td>5 CR</td>
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<td>T-INFO-101317</td>
<td>Deployment of Database Systems</td>
<td>5 CR</td>
<td>Böhm</td>
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<td>T-INFO-101257</td>
<td>Mechanisms and Applications of Workflow Systems</td>
<td>5 CR</td>
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**Election block: Foundations of Information Systems - Mandatory Courses (at least 1 item as well as at least 5 credits)**

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<td>Mechanisms and Applications of Workflow Systems</td>
<td>5 CR</td>
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**Competence Goal**

The students

- see the necessity of specialised systems for information management and are able to define and deploy decision criteria for purchasing such software,
- are aware of the fundamental approaches in information systems and are able to judge their potential applications,
- understand database applications and develop simple database applications on their own,
- are able to communicate at a professional level about technical aspects of information and knowledge management.

**Prerequisites**

None

**Content**

This module aims at exposing students to modern information systems. Beyond fundamental theory and concepts, this module covers the deployment of such technology.

**Recommendation**

It is recommended to take this module after completion of the module Communication and Database Systems [IW3INKD].

**Annotation**

The courses in this module are offered irregularly, however, the exam can be taken anytime.

**Workload**

approx. 300 h

For further details see the German version.
5.29 Module: Foundations of Marketing [M-WIWI-101424]

**Responsible:** Prof. Dr. Martin Klarmann

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

**Part of:**
- Advanced Studies in Economics and Management (Elective Modules in Business Administration)
- Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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<td>T-WIWI-102805</td>
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**Election block: Supplementary Courses (at least 4,5 credits)**

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<td>Services Marketing and B2B Marketing</td>
<td>3 CR</td>
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<tr>
<td>T-WIWI-102807</td>
<td>International Marketing</td>
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**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.

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

### Organisation
KIT Department of Economics and Management

### Part of
Advanced Studies in Economics and Management (Elective Modules in Business Administration)  
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

#### Election block: Compulsory Elective Courses (9 credits)

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<td>T-WIWI-109816</td>
<td>Foundations of Interactive Systems</td>
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<td>Each term</td>
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<td>3</td>
<td>6</td>
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<td>T-WIWI-110888</td>
<td>Practical Seminar: Digital Services</td>
<td>4.5</td>
<td>Each term</td>
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### 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 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.kسري.kit.edu/teaching.

### Workload
The total workload for this module is approximately 270 hours. For further information see German version.
5.31 Module: Human Resources and Organizations [M-WIWI-101513]

- **Responsible:** Prof. Dr. Petra Nieken
- **Organisation:** KIT Department of Economics and Management
- **Part of:**
  - Advanced Studies in Economics and Management (Elective Modules in Business Administration)
  - Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

### Credits
- 9

### Recurrence
- Each term

### Language
- German

### Level
- 3

### Version
- 4

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**Election block: Supplementary Courses (between 4.5 and 5.5 credits)**

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<td>Managing Organizations</td>
<td>3.5</td>
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<td>T-WIWI-102908</td>
<td>Personnel Policies and Labor Market Institutions</td>
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<td>Problem Solving, Communication and Leadership</td>
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### 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.
5.32 Module: Industrial Production I [M-WIWI-101437]

**Responsible:** Prof. Dr. Frank Schultmann

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

**Part of:**
- Advanced Studies in Economics and Management (Elective Modules in Business Administration)
- Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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<td>T-WIWI-102606</td>
<td>Fundamentals of Production Management</td>
<td>5.5 CR</td>
<td>Schultmann</td>
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**Election block: Supplementary Courses (3.5 credits)**

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<tr>
<td>T-WIWI-102870</td>
<td>Logistics and Supply Chain Management</td>
<td>3.5 CR</td>
<td>Schultmann, Wiens</td>
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<tr>
<td>T-WIWI-102820</td>
<td>Production Economics and Sustainability</td>
<td>3.5 CR</td>
<td>Schultmann, Volk</td>
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**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.
## Module: Information Security [M-WIWI-104069]

### Responsible:
Prof. Dr. Melanie Volkamer

### Organisation:
KIT Department of Economics and Management

### Part of:
Advanced Studies in Informatics

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<th>Duration</th>
<th>Language</th>
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<td>German</td>
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### Mandatory

| T-WIWI-110342 | Applied Informatics – Information Security | 4.5 CR | Volkamer |

### Election block: Compulsory Elective Courses (1 item)

| T-WIWI-108439 | Advanced Lab Security, Usability and Society | 4.5 CR | Volkamer |
| T-WIWI-109786 | Advanced Lab Security                     | 4.5 CR | Volkamer |

### Competence Goal

The student can explain and apply the basics of information security, knows appropriate measures to achieve different protection goals and can implement these measures, 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. Understanding the differences between information security in the enterprise and in the private context, knows the areas of application of a variety of relevant standards and knows their weaknesses, knows and can explain the problems of information security which may arise from human-machine interaction, can assess messages about detected security problems in a critical way, can structure a software project in the field of information security and explain and present results in oral and written form, and can use the techniques of Human Centred Security and Privacy by Design to create user-friendly software.

### Prerequisites

None

### 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.

### Annotation

This new module can be chosen from summer term 2018.

### Workload

The total workload for this module is approximately 270 hours.
5.34 Module: Information Services in Networks [M-WIWI-101440]

Responsible: N.N.
Prof. Dr. Hartmut Schmeck

Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Informatics

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Election block: Compulsory Elective Courses ()

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<td>T-INFO-101284</td>
<td>Integrated Network and Systems Management</td>
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<td>T-WIWI-110541</td>
<td>Advanced Lab Informatics (Master)</td>
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<td>T-WIWI-110848</td>
<td>Semantic Web Technologies</td>
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Competence Certificate
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

Prerequisites
None

Workload
The total workload for this module is approximately 270 hours. For further information see German version.
5.35 Module: Intellectual Property and Data Protection [M-INFO-101253]

**Responsible:** Prof. Dr. Thomas Dreier

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Law

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**Mandatory**

| T-INFO-109840 | Intellectual Property and Data Protection | 6 CR | Dreier, Eichenhofer |

**Content**

Building onto what the students have learned in law during the first two years of Bachelor studies, the module Law in the third Bachelor years has the purpose of both deepening and specialising the legal studies in areas of practical importance for information economics and management...
5.36 Module: Internship [M-WIWI-101433]

Responsible: Studiendekan der KIT-Fakultät für Informatik
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

Organisation: KIT Department of Economics and Management
Part of: Internship

Competence Certificate
The assessment is in the form of a certificate of employment about at least 6 weeks, a written report (typewritten, not handwritten) and a short presentation. The internship is not graded.

Competence Goal
This module serves to impart interdisciplinary key qualifications:

The student

- carries out professional tasks in the context of Information Engineering and Management to learn about the requirements on the engineer,
- describes in a short report the executed activities precisely and coherent, and judges about them critically,
- presents effectively is experiences gained during the internship using appropriate media support and gets involved professionally in the subsequent discussion, and
- trains via concrete and constructive criticism his/her competence for problem solving.

The presentation primarily serves for the communication between student, company, and examiner with the goal of initiating further cooperation in the context of the Bachelor thesis and/or a project

Prerequisites
None

Content
It is the responsibility of the students to apply for an internship in a suitable company or public organization at which the internship can be fulfilled.

The process for the internship has the following (sequential) steps:

1. **Choice of the examiner and of the company or organization by the student.**
   During the internship each student is attended by an examiner of the degree programme and by an advisor of the company. In case a student does not succeed in finding an examiner for the internship, he can request the assignment of an examiner from the examination board of the Bachelor programme in Information Engineering and Management. When enrolling for the internship, the student fills the form for the internship and he hands the form over to the examiner and the students’ secretary. If required, the students’ secretary certifies the compulsory character of the internship as part of the Bachelor programme in Information Engineering and Management.

2. **Internship**
   The student passes the internship in the chosen company or organization.

3. **Preparation of a short report and presentation:**
   At the end of the internship, the employment is proven by a certificate of employment. The examiner receives a report (maximal 2 A4 pages) and the student gives feedback on the internship with a short presentation (approx. 15 minutes) followed by a short discussion (approx. 5 minutes).

4. **Presentation and proof of performance.**
   The short presentation may by given in the form of a talk with the examiner, in a colloquium or in a seminar. The form is fixed at the registration of the internship with the examiner. The certificate of employment of the company and the short report must be delivered at the examiner before the presentation. Based on these, a certificate of performance if produced and transferred to the office of study ("Studienbüro").
**Recommendation**
It is recommended that the internship is taken between the 4th and the 5th term of the Bachelor programme Information Engineering and Management.

**Annotation**
The internship is regulated in §14a of the examination regulation.
Examiners are all lecturers of the degree programme.
The choice of the examiner has to be prior to the start of the internship (cf. content description).
The form for the internship is available at the examination offices of the two faculties participating in the programme.

**Workload**
See German version.
5.37 Module: Introduction to Civil Law [M-INFO-101190]

**Responsible:** Prof. Dr. Thomas Dreier

**Organisation:** KIT Department of Informatics

**Part of:** Law

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<th>Civil Law for Beginners</th>
<th>5 CR</th>
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5.38 Module: Introduction to Data and Information Management [M-INFO-101235]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

Mandatory

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Election block: Introduction to Data and Information Management (at least 1 item as well as at least 5 credits)

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T-INFO-101497 Database Systems

T-INFO-101305 Big Data Analytics

T-INFO-103552 Lab: Working with Database Systems

T-INFO-101317 Deployment of Database Systems

T-INFO-101257 Mechanisms and Applications of Workflow Systems

T-INFO-101977 Selling IT-Solutions Professionally

T-INFO-101975 Consulting in Practice

T-INFO-101976 Project Management in Practice

Competence Goal

The students

- see the necessity of specialised systems for information and data management and are able to define and deploy decision criteria for purchasing such software,
- are aware of the fundamental approaches in information and database systems and are able to judge their potential applications,
- understand database applications and develop simple database applications on their own,
- are able to communicate at a professional level about technical aspects of information and knowledge management

Prerequisites

None

Content

This module aims at exposing students to modern information and database systems. Beyond fundamental theory and concepts, this module covers the deployment of such technology.
### Module: Introduction to Operations Research [M-WIWI-101418]

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

#### Organisation:
- **Part of:** Operations Research
- **Kit Department of Economics and Management**

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

#### Mandatory

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<td>9 CR</td>
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**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.
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 | 1 | 2

**Mandatory**

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<td>CR</td>
<td>Grothe, Schienle</td>
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</table>

**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**

Keine

**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), internal estimations, linear regression

**Workload**

The total workload for this module is approximately 300 hours. For further information see German version.
# 5.41 Module: IT-Security Management for Networked Systems [M-INFO-100786]

**Responsible:** Prof. Dr. Hannes Hartenstein  
**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

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### 5.42 Module: Lego Mindstorms - Practical Course [M/INFO-102557]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour  
**Organisation:** KIT Department of Informatics  
**Part of:** Advanced Studies in Informatics

**Credits**  
4  
**Recurrence**  
Each winter term  
**Language**  
German  
**Level**  
3  
**Version**  
2

| Mandatory | T/INFO-107502 | Practical Course: Lego Mindstorms | 4 CR | Asfour |

**Competence Goal**  
The participants are able to design and construct a robot with motors and sensors using the Lego Mindstorms kit. The students are familiar with programming the Lego EV3 components using the Java programming language. They are able to understand and solve several key problems in mobile robotics, such as autonomous navigation, detection of landmarks and objects as well as obstacle avoidance. The students know how to efficiently and independently solve problems in a small group in a given time frame and are able to systematically document their work and results.

**Content**  
In this practical course, teams of three students build and program a mobile robot using Lego Mindstorms and the Java programming language. The robots are challenged to complete a versatile parkour including sections like the traversal of a maze, following a line, crossing a bridge or avoiding obstacle. After initial building of the robots, a section of the parkour will be set up each week and tackled by the robots, for which the students have to prepare their code beforehand. A final race of the robots on the entire parkour will be held at the end of the semester.

**Recommendation**  
Basic knowledge in JAVA is necessary for successful completion of this course.
5.43 Module: Mathematics I [M-MATH-101311]

Responsible: Prof. Dr. Andreas Rieder
Prof. Dr. Christian Wieners

Organisation: KIT Department of Mathematics
Part of: Mathematics

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Competence Certificate
The assessment in this module consists of
1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics I (1 credit) and
2. a written examination of 60 minutes on the lectures mathematics I following §4(2), 1 of the examination regulations (7 credits).

The grade of the module is computed as a weighted sum, where the grade of the written examination has a weight of 80% and the certificate a weight of 20%.

Competence Goal
Mathematical models are an important part in economical sciences. Therefore, the students need a basic knowledge in mathematics. The aim is the instruction in a comprehension of basic methods in analysis and linear algebra.

The students learn
- to use simple concepts and structures in mathematics;
- to recognize the mathematical structure of practical applications and to solve in simple cases mathematical problems;
- to comprehend the mathematical structure of more complex applications;
- to understand the mathematical basics to develop mathematical models for applications in cooperation with experts;
- to explain as a group member in the tutorial elementary mathematical structures and to stimulate in the discussion of examples the success of the group;
- to be in time for the tutorial group and for the preparation of homeworks;
- to work with basic mathematical literature.

The provides the foundations for
- comprehending the mathematical structure of more complex applications;
- developing mathematical models for applications in cooperation with experts;
- constructing algorithmical solutions of mathematical models for applications in cooperation with experts.

Prerequisites
None

Content
The lectures mathematics I and II give an overview in basic mathematical knowledge which is required to understand modern computer science and economical sciences. Part I consist of linear algebra including the basic algebraic structures, vector spaces and linear mappings. Many algebraic concepts are important for computer science. Part II consists of analysis including an introduction into the calculus of functions of one or several variables.

Annotation
None.

Workload
See German version.
5.44 Module: Mathematics II [M-MATH-101312]

| Responsible:                   | Prof. Dr. Andreas Rieder                  |
|                               | Prof. Dr. Christian Wieners               |
| Organisation:                 | KIT Department of Mathematics             |
| Part of:                      | Mathematics                               |

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Competence Certificate
The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics II (1 credit) and
2. a written examination of 60 minutes on the lectures mathematics II following §4(2), 1 of the examination regulations (7 credits).

The grade of the module is computed as a weighted sum, where the grade of the written examination has a weight of 80% and the certificate a weight of 20%.

Competence Goal
Mathematical models are an important part in economical sciences. Therefore, the students need a basic knowledge in mathematics. The aim is the instruction in a comprehension of basic methods in analysis and linear algebra.

The students learn
- to use simple concepts and structures in mathematics;
- to recognize the mathematical structure of practical applications and to solve in simple cases mathematical problems;
- to comprehend the mathematical structure of more complex applications;
- to understand the mathematical basics to develop mathematical models for applications in cooperation with experts;
- to explain as a group member in the tutorial elementary mathematical structures and to stimulate in the discussion of examples the success of the group;
- to be in time for the tutorial group and for the preparation of homeworks;
- to work with basic mathematical literature.

The provides the foundations for
- comprehending the mathematical structure of more complex applications;
- developing mathematical models for applications in cooperation with experts;
- constructing algorithmical solutions of mathematical models for applications in cooperation with experts.

Content
The lectures mathematics I and II give an overview in basic mathematical knowledge which is required to understand modern computer science and economical sciences. Part I consist of linear algebra including the basic algebraic structures, vector spaces and linear mappings. Many algebraic concepts are important for computer science. Part II consists of analysis including an introduction into the calculus of functions of one or several variables.

Workload
See German version.
5.45 Module: Mechano-Informatics and Robotics [M-INFO-100757]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

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Competence Goal
Students understand the basics of the synergistic integration of mechatronics, computer science and artificial intelligence methods on the example of humanoid robotics. They are acquainted with the basic concepts and methods of machine learning, the description of robot movements and actions as well as artificial neural networks and their application in robotics.

In particular, they are able to apply basic methods to problems and know relevant tools. Using research-oriented examples from humanoid robotics, students have learned - in an interactive way - to think analytically and to proceed in a structured and goal-oriented way when analyzing, formalizing and solving tasks.

Content
The lecture addresses topic at the interface between robotics and artificial intelligence, which are illustrated and explained based on examples from current research in the area of humanoid robotics. The lecture introduces fundamental algorithms in robotics and machine learning as well as methods for describing dynamical systems and representing of robot motions and actions. This includes an introduction to artificial neural networks, the description of dynamical systems in state space, the learning of movement primitives as well as methods for haptic perception for object exploration. The topics and content is illustrated using practical examples from humanoid robotics.

Recommendation
Basispraktikum Mobile Roboter.
## 5.46 Module: Methodical Foundations of OR [M-WIWI-101936]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Election block: Compulsory Elective Courses (at least 1 item as well as between 4,5 and 9 credits)**

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<td>Nonlinear Optimization I</td>
<td>4.5 CR</td>
<td>Stein</td>
</tr>
<tr>
<td>T-WIWI-103637</td>
<td>Nonlinear Optimization I and II</td>
<td>9 CR</td>
<td>Stein</td>
</tr>
</tbody>
</table>

**Election block: Supplementary Courses (at most 1 item)**

<table>
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<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td>T-WIWI-102727</td>
<td>Global Optimization II</td>
<td>4.5 CR</td>
<td>Stein</td>
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<tr>
<td>T-WIWI-102725</td>
<td>Nonlinear Optimization II</td>
<td>4.5 CR</td>
<td>Stein</td>
</tr>
<tr>
<td>T-WIWI-102704</td>
<td>Facility Location and Strategic Supply Chain Management</td>
<td>4.5 CR</td>
<td>Nickel</td>
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</table>

**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" and "Global Optimization I" has to be examined.

**Content**

The module 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.

**Annotation**

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

**Workload**

The total workload for this module is approximately 270 hours. For further information see German version.
5.47 Module: Mobile Computing and Internet of Things [M-INFO-101249]

Responsible: Prof. Dr.-Ing. Michael Beigl
Organisation: KIT Department of Informatics
Part of: Advanced Studies in Informatics

<table>
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<tr>
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<th>Level</th>
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<td>3</td>
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</table>

Mandatory

| T-INFO-102061 | Mobile Computing and Internet of Things | 5 CR | Beigl |

Prerequisites

None
5.48 Module: Mobile Robots – Practical Course [M-INFO-101184]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

<table>
<thead>
<tr>
<th>Credits</th>
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<th>Level</th>
<th>Version</th>
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<td>3</td>
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</table>

**Mandatory**

| T-INFO-101992 | Mobile Robots – Practical Course | 4 CR | Asfour |

**Competence Goal**

The student is able to understand circuit diagrams and can assemble, test and debug complex PCBs. The student is familiar with programming microcontroller-based embedded systems using the C language and cross compilers. The student is able to use methods for controlling robotic sensors and actuators, can conduct experiments with robots and solve tasks in this context independently and in small groups.

**Content**

In this practical course, students assemble an ASURO robot in groups of two. Each student will be provided with his own robot, which he has to put into operation. While using the robots, a new set of problems will be solved each week. The students will need to prepare for each week given the provided material. Sets of problems be solved using the C language and focus on controlling the robot’s sensors and actuators as well as on the generation of reflex-based behavior. The course ends with a race, where the robots have to tackle an obstacle course.
5.49 Module: Module Bachelor Thesis [M-WIWI-101611]

**Responsible:** Studiendekan der KIT-Fakultät für Informatik
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** Bachelor Thesis

**Credits:** 12
**Recurrence:** Once
**Language:** German
**Level:** 3
**Version:** 3

### Competence Certificate

The Bachelor thesis is examined by an examiner following the examination regulation. 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.

### 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

The regulations for the Bachelor thesis can be found in §14 of the examination regulation.

### Content

The Bachelor thesis is a written report which shows that the student can autonomously investigate a scientific problem in Information Engineering and Management. The work load for the Bachelor thesis should be 360h. The recommended project time is 6 months. The Bachelor thesis may also be written in English.

### Workload

The total workload for this module is approximately 360 hours. For further information see German version.
M 5.50 Module: Optimization under Uncertainty [M-WIWI-103337]

Responsible: Prof. Dr. Steffen Rebennack
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

<table>
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<th>Duration</th>
<th>Level</th>
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<td>T-WIWI-106546</td>
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<td>4,5 CR Rebennack</td>
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Election block: Supplementary Courses (at most 1 item)

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<td>T-WIWI-102724</td>
<td>Nonlinear Optimization I</td>
<td>4,5 CR Stein</td>
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<tr>
<td>T-WIWI-102714</td>
<td>Tactical and Operational Supply Chain Management</td>
<td>4,5 CR Nickel</td>
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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
The course Introduction to Stochastic Optimization 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 for this module is approximately 270 hours (9 credits). The allocation is made according to the credit points of the courses of the module. The total number of hours per course is determined by the amount of time spent attending the lectures and exercises, as well as the exam times and the time required to achieve the module's learning objectives for an average student for an average performance.
**5.51 Module: Orientation Exam [M-WIWI-101528]**

**Organisation:** University  
**Part of:** Orientation Exam

<table>
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<tr>
<td>T-INFO-101964</td>
<td>6</td>
<td>Basic Notions of Computer Science</td>
<td>CR</td>
<td>Stüker, Worsch</td>
</tr>
<tr>
<td>T-INFO-101531</td>
<td>5</td>
<td>Programming</td>
<td>CR</td>
<td>Koziolek, Reussner</td>
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<tr>
<td>T-WIWI-102708</td>
<td>5</td>
<td>Economics I: Microeconomics</td>
<td>CR</td>
<td>Puppe, Reiß</td>
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<tr>
<td>T-INFO-101965</td>
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<td>Basic Notions of Computer Science Pass</td>
<td>CR</td>
<td>Stüker, Worsch</td>
</tr>
<tr>
<td>T-INFO-101967</td>
<td>0</td>
<td>Programming Pass</td>
<td>CR</td>
<td>Koziolek, Reussner</td>
</tr>
</tbody>
</table>

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

**Prerequisites**  
None
## 5.52 Module: Programming [M-INFO-101174]

**Responsible:** Prof. Dr.-Ing. Anne Koziolek  
Prof. Dr. Ralf Reussner  
Prof. Dr.-Ing. Gregor Snelting  

**Organisation:** KIT Department of Informatics  
**Part of:** Informatics  

<table>
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### Mandatory

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<tbody>
<tr>
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<td>Programming Pass</td>
<td>0 CR</td>
<td>Koziolek, Reussner</td>
</tr>
<tr>
<td>T-INFO-101531</td>
<td>Programming</td>
<td>5 CR</td>
<td>Koziolek, Reussner</td>
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</tbody>
</table>

### Competence Goal

Students should learn:

- basic structures of the programming language Java and how to apply them; in particular control and simple data structures, object orientation and implementation of basic algorithms
- basics of programming methodology and the ability to autonomously write executable small to medium sized Java programs

### Content

- objects and classes  
- types, values and variables  
- methods  
- control structures  
- recursion  
- references, lists  
- inheritance  
- input and output  
- exceptions  
- programming methodology  
- implementation of basic algorithms in Java (such as sorting algorithms)
5.3 Module: Public Finance [M-WIWI-101403]

**Responsible:** Prof. Dr. Berthold Wigger

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

**Part of:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

<table>
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<th>Recurrence</th>
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<th>Language</th>
<th>Level</th>
<th>Version</th>
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<tbody>
<tr>
<td>9</td>
<td>Each term</td>
<td>1 semester</td>
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**Election block: Compulsory Elective Courses (9 credits)**

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<th>Course Title</th>
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<tbody>
<tr>
<td>T-WIWI-102877</td>
<td>Introduction to Public Finance</td>
<td>4.5 CR</td>
<td>Wigger</td>
</tr>
<tr>
<td>T-WIWI-108711</td>
<td>Basics of German Company Tax Law and Tax Planning</td>
<td>4.5 CR</td>
<td>Gutekunst, Wigger</td>
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<tr>
<td>T-WIWI-102739</td>
<td>Public Revenues</td>
<td>4.5 CR</td>
<td>Wigger</td>
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<tr>
<td>T-WIWI-109590</td>
<td>Public Sector Finance</td>
<td>4.5 CR</td>
<td>Wigger</td>
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**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.
5.54 Module: Real Estate Management [M-WIWI-101466]

**Responsible:** Prof. Dr.-Ing. Thomas Lützkendorf

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

**Part of:**
- Advanced Studies in Economics and Management (Elective Modules in Business Administration)
- Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Mandatory**

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<td>Real Estate Management I</td>
<td>4.5</td>
<td>Lützkendorf</td>
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<tr>
<td>T-WIWI-102745</td>
<td>Real Estate Management II</td>
<td>4.5</td>
<td>Lützkendorf</td>
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**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.
5.55 Module: Security [M-INFO-100834]

**Responsible:** Prof. Dr. Jörn Müller-Quade

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

<table>
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<tr>
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<th>Recurrence</th>
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<th>Level</th>
<th>Version</th>
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**Mandatory**

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<td>6 CR</td>
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Hofheinz, Müller-Quade
Module: Semantic Knowledge Management [M-WIWI-101438]

**Responsible:** Prof. Dr. York Sure-Vetter  
**Organisation:** KIT Department of Economics and Management  
**Part of:** Advanced Studies in Informatics

<table>
<thead>
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<th>Recurrence</th>
<th>Duration</th>
<th>Language</th>
<th>Level</th>
<th>Version</th>
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<td>Each term</td>
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<td>German/English</td>
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</table>

**Mandatory**

- **T-WIWI-110848** Semantic Web Technologies 4,5 CR Sure-Vetter

**Election block: Supplementary Courses (at least 1 item)**

- **T-WIWI-110340** Applied Informatics – Applications of Artificial Intelligence 4,5 CR Sure-Vetter
- **T-WIWI-102697** Business Process Modelling 4,5 CR Oberweis
- **T-WIWI-110541** Advanced Lab Informatics (Master) 4,5 CR Professorenschaft des Fachbereichs Informatik

**Competence Certificate**

The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits and truncated after the first decimal.

**Competence Goal**

**Students**

- know the motives for the application of knowledge management in organizations
- know the basic design dimensions of holistic knowledge management (organization, human, information technology, corporate culture)
- know the main group of IT systems for knowledge management and are able to describe the relevant application scenarios and basic operating modes of these systems
- know how to use the different IT systems for knowledge management in practice
- know the basic standards for the modeling of information and processes and are able to describe their formal structures
- know how to apply the different modeling languages
- know criteria to evaluate the success of knowledge management systems and are able to apply them to assess defined knowledge management scenarios

**Prerequisites**

Lecture **Semantic Web Technologien [2511310]** is mandatory.

**Content**

In modern companies the availability and usability of knowledge is an essential factor of success for central managerial tasks and duties such as the improvement of business processes, product innovation and the amelioration of customer satisfaction.

This module illustrates the typical problems of knowledge management in organizations and presents IT methods to approach these questions. The relevant groups of knowledge management systems are analyzed and expanded in the subject areas knowledge representation/semantic modeling and document management/groupware systems.

**Annotation**

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

**Workload**

The workload is app. 270 hours.
5.57 Module: Seminar Module Economic Sciences [M-WIWI-101826]

**Responsible:** Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** Research Course

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

### Election block: Compulsory Elective Courses (1 item)

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<td>T-WIWI-103486</td>
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<tr>
<td>T-WIWI-103488</td>
<td>Seminar in Operations Research (Bachelor)</td>
<td>3 CR</td>
<td>Nickel, Rebennack, Stein</td>
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<tr>
<td>T-WIWI-103489</td>
<td>Seminar in Statistics (Bachelor)</td>
<td>3 CR</td>
<td>Grothe, Schienle</td>
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<tr>
<td>T-WIWI-103487</td>
<td>Seminar in Economics (Bachelor)</td>
<td>3 CR</td>
<td>Professorenschaft des Fachbereichs Volkswirtschaftslehre</td>
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</table>

**Competence Certificate**
The assessment is done by a seminar with at least 3 CP. The assessment of the seminar (following §4(2), 3 ER) is described at the course description.

**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**
None.

**Content**
The module consists of a seminar, that is related to the research field of economic sciences. A complete list of available seminars is published in the internet.

**Annotation**
The mentioned seminars in this module handbook are place holders. For each semester, a complete list of seminars are published in the Vorlesungsverzeichnis or at the web pages of the participating institutes. Often, the seminar topics for a given semester are published at the end of the preceding semester. Some seminars require an early sign-in deadline at the end of the of the preceding semester.

**Workload**
The total workload for this module is approximately 90 hours.
5.8 Module: Seminar Module Informatics [M-INFO-102058]

**Responsible:** Dr. Ioana Gheta  
Jürgen Weixler  
Dr. André Wiesner

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

**Part of:** Research Course

<table>
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**Election block: Seminar Informatics (1 item)**

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5.59 Module: Seminar Module Law [M-INFO-101218]

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

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**Mandatory**

| T-INFO-101997 | Seminar: Legal Studies I | 3 CR | Dreier |
5.60 Module: Software Engineering I [M-INFO-101175]

**Responsible:**
- Prof. Dr.-Ing. Anne Koziolek
- Prof. Dr. Ralf Reussner
- Prof. Dr. Walter Tichy

**Organisation:**
- KIT Department of Informatics

**Part of:**
- Informatics

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**Competence Goal**
The students acquire basic knowledge about the principles, methods and tools of software engineering. They learn how to build and to maintain complex software systems in a systematic way.

**Content**
The content of the lecture is the entire lifecycle of software, spanning project planning, system analysis, cost estimation, design, implementation, validation, verification, and finally the maintaining of software. The covered topics include UML, design patterns, software tools, programming environments and configuration control/versioning systems.

**Workload**
approx. 180 h
5.61 Module: Software Engineering II [M-INFO-100833]

**Responsible:** Prof. Dr.-Ing. Anne Koziolcke
Prof. Dr. Ralf Reussner
Prof. Dr. Walter Tichy

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

<table>
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**Mandatory**

| T-INFO-101370 | Software Engineering II | 6 CR | Koziolek, Reussner, Tichy |

**Content**
Requirements engineering, software development processes, software quality, software architectures, MDD, Enterprise Software Patterns software maintainability, software security, dependability, embedded software, middleware, domain-driven design
### 5.62 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:** Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Mandatory**  
| Credits | Recurrence | Language | Level | Version |
| 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 techiques necessary to conduct valid regression, time series and multivariate analysis.

**Workload**  
The total workload for this module is approximately 270 hours.
5.63 Module: Strategy and Organization [M-WIWI-101425]

**Responsible:** Prof. Dr. Hagen Lindstädt

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

**Part of:**
- Advanced Studies in Economics and Management (Elective Modules in Business Administration)
- Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Election block: Strategy and Organization (at least 9 credits)**

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**Competence Certificate**

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

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

**Competence Goal**

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

**Content**

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

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

**Workload**

The total workload of the module is about 240 hours. The workload is proportional to the credit points of the individual courses.
Module: Supply Chain Management [M-WIWI-101421]

Responsible: Prof. Dr. Stefan Nickel
Organisation: KIT Department of Economics and Management
Part of: Advanced Studies in Economics and Management (Elective Modules in Business Administration)
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

Credits 9
Recurrence Each term
Duration 1 semester
Language German/English
Level 3
Version 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
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.
5.65 Module: Telematics [M-INFO-101194]

**Responsible:** Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:** Advanced Studies in Informatics

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<td>T-INFO-101338</td>
<td>Telematics</td>
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**Competence Goal**
The students will broaden their knowledge of computer networks initially learnt in the module Telematics [IW3INTM]. They learn about problems and solutions in the domains of wireless, multimedia, or secure communications and they will be able to analyse and evaluate specific solutions in those domains.

**Prerequisites**
None

**Content**
Selected protocols, architectures, mechanisms, and algorithms in the chosen domains will be analysed in detail. The student hereby may choose among mobile and wireless communications, principles of the design of secure communication protocols, and protocols and techniques for multimedia communication.

**Recommendation**
The lecture Telematics [24128] builds on the content of the lecture Introduction in Computer Networks [24519] and should therefore only be taken after successful completion of the lecture Introduction in Computer Networks [24519].

**Workload**
approx. 300 h
For further details see the German version.
### Module: Theoretical Informatics [M-INFO-101189]

**Responsible:** Prof. Dr. Jörn Müller-Quade  
Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** Informatics  

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**Müller-Quade, Sanders, Wagner**

### Competence Certificate

The assessment of the module consists of a written examination according to §4(2), 1 of the examination regulations. The grade of the module corresponds to the grade of the written examination. Further details see the german section.

### Competence Goal

The student

- has a deeper insight into the fundamentals of theoretical computer science and knows the computation models and proof techniques,
- understands the limits and possibilities of computer science in relation to the solution of definable but only partially predictable problems,
- knows basic aspects of computer science in contrast to specific circumstances, such as specific computers or programming languages and also can phrase general statements about the solvability of problems,
- is able to apply the proof techniques learned for the specification of systems of computer science and for the systematic design of programs and algorithms.

### Content

There are important problems whose solutions can clearly be defined but one will never be able to calculate such a solution systematically. Other problems are "likely" to be solved only through trial and error. Other topics of the module provide the basis for circuit design, design of compilers, and many others. Most results are rigorously proved. The proof techniques learned by the way are important for the specification of systems of computer science and for the systematic design of programs and algorithms.

The module provides a deep insight into the principles and methods of theoretical computer science. In particular, this will be discussed on the basic properties of Formal Languages as foundations of programming languages and communication protocols (regular, context-free Chomsky hierarchy), machine models (finite automata, pushdown automata, Turing machines, non determinism, and relations to families of formal languages), equivalence of sufficiently powerful computation models (Church’s thesis), non computable important functions (halting problem,...), Gödel’s incompleteness theorem and introduction to complexity theory, NP-complete problems and polynomial reductions.

### Workload

approx. 210 h
### 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:** Advanced Studies in Economics and Management (Elective Modules in Business Administration)  
Advanced Studies in Economics and Management (Elective Modules in Economics and Management)

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**Election block: Compulsory Elective Courses (9 credits)**

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<td>4.5</td>
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<td>Financial Intermediation</td>
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<td>Business Strategies of Banks</td>
<td>3.0</td>
<td>Müller</td>
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<td>Basics of German Company Tax Law and Tax Planning</td>
<td>4.5</td>
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<td>T-WIWI-110511</td>
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**Competence Certificate**

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

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

**Competence Goal**

The student

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

**Prerequisites**

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

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

**Content**

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

**Annotation**

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

**Workload**

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

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

5.68 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: | Advanced Studies in Economics and Management (Elective Modules in Business Administration)  
|           | Advanced Studies in Economics and Management (Elective Modules in Economics and Management)  

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Election block: Compulsory Elective Courses (9 credits)

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Competence Certificate

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

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

Competence Goal

The student

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

Prerequisites

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

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

Content

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

Annotation

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

Workload

The total workload for this module is approximately 270 hours.
### 6 Courses

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

**Responsible:** Professorenschaft des Fachbereichs Informatik

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

**Part of:**
- M-WIWI-101438 - Semantic Knowledge Management
- M-WIWI-101440 - Information Services in Networks
- M-WIWI-101476 - Business Processes and Information Systems

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<td>Lab Business Information Systems: Realisation of innovative services (Bachelor)</td>
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<td>Practical course (P)</td>
<td>Oberweis, Schiefer, Schüler, Toussaint</td>
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<td>SS 2020 2512400</td>
<td>Development of Sociotechnical Information Systems (Bachelor)</td>
<td>3 SWS</td>
<td>Practical course (P)</td>
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<tr>
<td>SS 2020 2512402</td>
<td>Praktikum Blockchain und Distributed Ledger Technology (Bachelor)</td>
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<td>SS 2020 2512554</td>
<td>Practical lab Security, Usability and Society (Bachelor)</td>
<td>3 SWS</td>
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<td>WS 20/21 2512402</td>
<td>Practical Course Blockchain Hackathon (Bachelor)</td>
<td>SWS</td>
<td>Practical course (P)</td>
<td>Sunyaev, Kannengieber</td>
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<tr>
<td>WS 20/21 2512501</td>
<td>Practical Course Cognitive Automobiles and Robots (Master)</td>
<td>3 SWS</td>
<td>Practical course (P)</td>
<td>Zöllner</td>
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<tr>
<td>WS 20/21 2512600</td>
<td>Project lab Information Service Engineering (Master)</td>
<td>2 SWS</td>
<td>Practical course (P)</td>
<td>Sack</td>
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<tr>
<td>WS 20/21 2513312</td>
<td>Seminar Linked Data and the Semantic Web (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Acosta Deibe, Käfer, Heling</td>
</tr>
<tr>
<td>WS 20/21 2513313</td>
<td>Seminar Linked Data and the Semantic Web (Master)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Acosta Deibe, Käfer, Heling</td>
</tr>
</tbody>
</table>

**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:**

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

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
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/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.
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

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 ISE project course can also be credited as a seminar.

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

The project course will be restricted to 15 participants.

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

ISE Tutor Team:
- Dr. Mehwish Alam
- Dr. Danilo Dessi
- M. Sc. Genet Asefa Gesese
- M. Sc. Fabian Hoppe
- M. Sc. Zahra Rezaie
- M. Sc. Sasha Vsesvita ska
- 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

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

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

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104069 - Information Security

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<td>Examination of another type</td>
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Events

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<th>4 SWS</th>
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<th>Baumgart, Volkamer, Mayer</th>
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Competence Certificate

The alternative exam assessment consists of:

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

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

Prerequisites

None

Recommendation

Knowledge from the lecture "Information Security" is recommended.

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

Practical Course Security (Master)

2512557, WS 20/21, 4 SWS, Language: German, [Open in study portal]

Content

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

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

More information on [https://ilias.studium.kit.edu/goto_produktiv_crs_998421.html](https://ilias.studium.kit.edu/goto_produktiv_crs_998421.html)
6 COURSES

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

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104069 - Information Security

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Events

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<tr>
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<td>2512554</td>
<td>Practical lab Security, Usability and Society (Bachelor)</td>
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<td>Practical Course Security, Usability and Society (Bachelor)</td>
<td>3</td>
<td>Practical course (P)</td>
<td>Volkamer, Aldag, Düzgün, Mayer, Mossano, Reinheimer</td>
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<tr>
<td>WS 20/21</td>
<td>2512555</td>
<td>Practical Course Security, Usability and Society (Master)</td>
<td>3</td>
<td>Practical course (P)</td>
<td>Volkamer, Aldag, Düzgün, Mayer, Mossano, Reinheimer</td>
</tr>
</tbody>
</table>

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:

Practical lab Security, Usability and Society (Bachelor)
2512554, SS 2020, 3 SWS, Language: English, Open in study portal
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 KASTE 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/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, Open in study portal

Content
Kick-off Meeting (compulsory attendance) on 18.10.2019 at 11:00 in room 3A-11.2
<table>
<thead>
<tr>
<th>V</th>
<th><strong>Practical Course Security, Usability and Society (Master)</strong></th>
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<tr>
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</table>

**Content**

Kick-off Meeting (compulsory attendance) on 18.10.2019 at 11:00 in room 3A-11.2
### 6.4 Course: Advanced Object Orientation [T-INFO-101346]

**Responsible:** Prof. Dr.-Ing. Gregor Snelting  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-100809 - Advanced Object Orientation

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</table>
6.5 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

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<td>Advanced Topics in Economic Theory</td>
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<td>Lecture (V)</td>
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<td>2520528</td>
<td>Übung zu Advanced Topics in Economic Theory</td>
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**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:

**Advanced Topics in Economic Theory**  
2520527, SS 2020, 2 SWS, Language: English, Open in study portal

**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.
6.6 Course: Algorithmic Methods for Hard Optimization Problems [T-INFO-103334]

<table>
<thead>
<tr>
<th>Responsible</th>
<th>Prof. Dr. Dorothea Wagner</th>
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<tr>
<td>Organisation</td>
<td>KIT Department of Informatics</td>
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### 6.7 Course: Algorithms for Planar Graphs [T-INFO-101986]

**Responsible:** Prof. Dr. Dorothea Wagner  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101220 - Algorithms for Planar Graphs

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**Events**

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<th>SS 2020</th>
<th>24614</th>
<th>Algorithmen für planare Graphen (mit Übungen)</th>
<th>3 SWS</th>
<th>Lecture / Practice (VÜ)</th>
<th>Ueckerdt, Gottesbüren</th>
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6.8 Course: Algorithms I [T-INFO-100001]

**Responsible:** Prof. Dr. Peter Sanders

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-100030 - Algorithms I

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<td>Dachsbacher, Schüßler, Jung, Opitz</td>
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6.9 Course: Algorithms II [T-INFO-102020]

**Responsible:** Prof. Dr. Hartmut Prautzsch  
Prof. Dr. Peter Sanders  
Prof. Dr. Dorothea Wagner  

**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101173 - Algorithms II

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<td>4 SWS</td>
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**Type:** Written examination  
**Credits:** 6  
**Recurrence:** Each winter term  
**Version:** 1
6.10 Course: Analysis of Multivariate Data [T-WIWI-103063]

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

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

**Part of:** M-WIWI-101599 - Statistics and Econometrics

### 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.
6.11 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-101438 - Semantic Knowledge Management

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**Events**

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<td>WS 20/21</td>
<td>2511314</td>
<td>Applied Informatics - Applications of Artificial Intelligence</td>
<td>2</td>
<td>Lecture (V)</td>
<td>Sure-Vetter</td>
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<td>WS 20/21</td>
<td>2511315</td>
<td>Exercises to Applied Informatics - Applications of Artificial Intelligence</td>
<td>1</td>
<td>Practice (Ü)</td>
<td>Sure-Vetter, Nguyen</td>
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**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)
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

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.

Responsible: Prof. Dr. Melanie Volkamer
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-104069 - Information Security

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<td>1 SWS</td>
<td>Exercise Applied Informatics - Information Security</td>
<td>Practice (Ü)</td>
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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.

Annotation
Replaces from summer term 2020 T-WIWI-108387 "Information Security".

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

Applied Informatics - Information Security
2511550, SS 2020, 2 SWS, Open in study portal

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


Exercise Applied Informatics - Information Security
2511551, SS 2020, 1 SWS, Open in study portal

Content
This course can also be credited for the KASTEL certificate. Further information about obtaining the certificate can be found on the SECUSO website [https://secuso.aifb.kit.edu/Studium_und_Lehre.php](https://secuso.aifb.kit.edu/Studium_und_Lehre.php).

 Responsible: Prof. Dr. Andreas Oberweis
                      Prof. Dr. York Sure-Vetter
 Organisation: KIT Department of Economics and Management
  Part of: M-WIWI-101430 - Applied Informatics

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<td>2</td>
<td>Lecture (V) Oberweis, Käfer, Schiefer</td>
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<td>1</td>
<td>Practice (Ü) Oberweis, Käfer, Schiefer</td>
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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

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 aspectes, the second part covers the modelling of dynamic aspects of information systems.

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

Learning objectives:
Students

- explain the strengths and weaknesses of various modeling 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
- Presence time: 45 hours
- Self study: 75-90 hours
Literature


Weiterführende Literatur:


Exercises to Applied Informatics - Modelling

2511031, WS 20/21, 1 SWS, Language: German, [Open in study portal]

Content

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

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

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

Learning objectives:

Students

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

Literature


Weiterführende Literatur:

6 COURSES


Responsible: Prof. Dr. Ali Sunyaev
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101430 - Applied Informatics

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Events

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<td>2 SWS</td>
<td>Applied Informatics - Principles of Internet Computing: Foundations for Emerging Technologies and Future Services</td>
<td>Lecture (V)</td>
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<td>1 SWS</td>
<td>Übungen zu Angewandte Informatik - Internet Computing</td>
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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

Recommendation
Knowledge of content of the modules Basic Notions of Computer Science and Algorithms I is expected.

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
2511032, SS 2020, 2 SWS, Language: German, Open in study portal

Lecture (V)
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
### 6.15 Course: Auction & Mechanism Design [T-WIWI-102876]

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

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<td>Szech, Huber</td>
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**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](#)
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
6.16 Course: Bachelor Thesis [T-WIWI-103095]

**Responsible:** Prof. Dr. Sebastian Abeck
Prof. Dr. Hagen Lindstädt

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

**Part of:** M-WIWI-101611 - Module Bachelor Thesis

**Type**
- Final Thesis

**Credits**
- 12

**Version**
- 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
6.17 Course: Basic Notions of Computer Science [T-INFO-101964]

**Responsible:** Dr. Sebastian Stüker  
Thomas Worsch

**Organisation:** KIT Department of Informatics

**Part of:**  
M/INFO-101170 - Basic Notions of Computer Science  
M/WIWI-101528 - Orientation Exam

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## 6.18 Course: Basic Notions of Computer Science Pass [T-INFO-101965]

**Responsible:** Dr. Sebastian Stüker  
Thomas Worsch  

**Organisation:** KIT Department of Informatics  

**Part of:**  
M-INFO-101170 - Basic Notions of Computer Science  
M-WIWI-101528 - Orientation Exam  

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6 COURSES

Course: Basic Principles of Economic Policy [T-WIWI-103213]

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

Prerequisites
None

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

Annotation
Description:
Theory of general economic policy and discussion of current economic policy topics:

• Goals of economic policy,
• Instruments and institutions of economic policy,
• Triad of regional, national and European economic policies,
• special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

Learning objectives:
Students learn:

• To apply basic concepts of micro- and macroeconomic theories to economic policy issues.
• to develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
• to derive theory-based policy recommendations.

Learning content:

• Market interventions: microeconomic perspective
• Market interventions: macroeconomic perspective
• Institutional economic aspects
• Economic policy and welfare economics
• Economic policy makers: Political-economic aspects

Workload:

• Total effort at 4.5 LP: approx. 135 hours
• Presence time: approx. 30 hours
• Self-study: approx. 105 hours

Media:
See course announcement

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

### Basic Principles of Economic Policy

**2560280, SS 2020, 2 SWS, Language: German, Open in study portal**

#### Lecture (V)

**Content**

The lecture deals with theories of general economic policy and discussion of current economic policy topics:

- Goals of economic policy,
- Instruments and institutions of economic policy,
- Triad of regional, national and European economic policies,
- special fields of economic policy, in particular growth, employment, provision of public infrastructure and climate policy.

**Learning objectives:**

Students shall be given the ability to

- apply basic concepts of micro- and macroeconomic theories to economic policy issues
- develop arguments on how state intervention in the market can be legitimized from a welfare economic perspective
- derive theory-based policy recommendations

**Recommendations:**

Basic micro- and macroeconomic knowledge is required, especially as taught in the courses Economics I [2610012] and Economics II [2600014].

**Workload:**

Total effort at 4.5 LP is approx. 135 hours and consists of:

- Presence time: approx. 30 hours
- Self-study: approx. 105 hours

**Assessment:**

The examination takes place in the form of a written examination (60min) (according to §4(2), 1 SPO). The examination is offered every semester and can be repeated at any regular examination date.

**Organizational issues**

Zugehörige Veranstaltung: Übungen zur Einführung in die Wirtschaftspolitik [2560281]

**Literature**

- Foliensatz zur Vorlesung
- Übungsaufgaben

### Exercises of Basic Principles of Economic Policy

**2560281, SS 2020, 1 SWS, Language: German, Open in study portal**

**Organizational issues**

Zugehörige Veranstaltung: [2560280] Einführung in die Wirtschaftspolitik

**Literature**

- Foliensatz zur Vorlesung
- Übungsaufgaben
6.20 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

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**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:_

**Basics of German Company Tax Law and Tax Planning**

2560134, WS 20/21, 3 SWS, Language: German, [Open in study portal](#)

**Content**

**Workload:**

The total workload for this course is approximately 135.0 hours. For further information see German version.
6.21 Course: Big Data Analytics [T-INFO-101305]

Responsible: Prof. Dr.-Ing. Klemens Böhm
Organisation: KIT Department of Informatics
Part of: M-INFO-101193 - Foundations of Information Systems
         M-INFO-101193 - Foundations of Information Systems
         M-INFO-101229 - Database Systems in Theory and Practice
         M-INFO-101235 - Introduction to Data and Information Management

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6.22 Course: Big Data Analytics 2 [T-INFO-105742]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101193 - Foundations of Information Systems

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**Prerequisites**
none
### 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-101491 - Foundations in Business Administration

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**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:*

**Business Administration: Finance and Accounting**

2610026, WS 20/21, 2 SWS, Language: German, Open in study portal

**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 Materialen zur Vorlesung gegeben.
6.24 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-101492 - Business Administration

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**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:

**Business Administration: Production Economics and Marketing**

2600024, SS 2020, 2 SWS, Language: German, [Open in study portal](#)
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 Materialen zur Vorlesung.
6.25 Course: Business Process Modelling [T-WIWI-102697]

Responsibility: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101438 - Semantic Knowledge Management
M-WIWI-101476 - Business Processes and Information Systems

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Competence Certificate
The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites
None

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

Business Process Modelling
2511210, WS 20/21, 2 SWS, Language: German, Open in study portal

Content
The proper modeling of relevant aspects of business processes is essential for an efficient and effective design and implementation of processes. This lecture presents different classes of modeling languages and discusses the respective advantages and disadvantages of using actual application scenarios. For that simulative and analytical methods for process analysis are introduced. In the accompanying exercise the use of process modeling tools is practiced.

Learning objectives:
Students
- describe goals of business process modeling and apply different modeling languages,
- choose the appropriate modeling language according to a given context,
- use suitable tools for modeling business processes,
- apply methods for analysing and assessing process models to evaluate specific quality characteristics of the process model.

Recommendations:
Knowledge of course Applied Informatics I - Modelling is expected.

Workload:
- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h

Literature

Weitere Literatur wird in der Vorlesung bekannt gegeben.
6.26 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

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Competence Certificate

See German version.

Prerequisites

None

Recommendation

None

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

Business Strategies of Banks

2530299, WS 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)

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; Pfingsten, Andreas; Weber, Martin; 2014, Bankbetriebslehre, 6. Auflage, Springer
## 6.27 Course: Civil Law for Beginners [T-INFO-103339]

**Responsible:** Dr. Yvonne Matz  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101190 - Introduction to Civil Law

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

**Responsible:** Prof. Dr. Kay Mitusch

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

**Part of:**
- M-WIWI-101499 - Applied Microeconomics
- M-WIWI-101668 - Economic Policy I

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**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.
### 6.29 Course: Computer Architecture [T-INFO-101355]

**Responsible:** Prof. Dr.-Ing. Jörg Henkel  
Prof. Dr. Wolfgang Karl  

**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-100818 - Computer Architecture

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6.30 Course: Computer Organization [T-INFO-103531]

**Responsible:** Prof. Dr. Wolfgang Karl

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-101836 - Computer Engineering

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6 COURSES

6.31 Course: Consulting in Practice [T-INFO-101975]

 Responsible: Prof. Dr.-Ing. Klemens Böhm
 Organisation: KIT Department of Informatics
 Part of: M-INFO-101193 - Foundations of Information Systems
 M-INFO-101235 - Introduction to Data and Information Management

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

Praxis der Unternehmensberatung

Content

The market for consulting services grows annually by 20% and is therefore one of the leading growth sectors and professional fields in the future. This trend is in particular driven by the IT industry. Here, widely used standard software moves the focus of the future professional field from software development to consulting. In this context, consulting services have usually a broad definition, reaching from pure IT-focused consulting (e.g., deployment of SAP) to strategic consulting (strategy, organisation etc). In contrast to common rumors, a qualification in business studies is not a must. This opens up a diversified and exciting field with exceptional development perspectives for computer science students. The course deals thematically with the two fields consulting in general and function-specific consulting (with IT consulting as an example).

The structure of the course is oriented along the phases of a consulting project:

- Diagnosis: The consultant as an analytic problem solver.
- Strategic adjustment/redesign of the core processes: Optimisation/redesign of essential business functionality to solve the diagnosed problems in cooperation with the client.
- Implementation: Installation of the solutions in the clients’s organisation for assuring the implementation.

Emphasised topics in the course are:

- Elementary problem solving: Problem definition, structuring of problems and focussing through the usage of tools (e.g., logic and hypothesis trees), creative techniques, solution systems etc.
- Obtaining information effectively: Access of information sources, interview techniques etc.
- Effective communication of findings/recommendations. Analysis/planning of communication (media, audience, formats), communication styles (e.g., top-down vs. bottom-up), special topics (e.g., arrangement of complex information) etc.
- Efficient teamwork: Tools for optimising efficient work, collaboration with clients, intellectual and process leadership in the team etc.

At the end of the course, the participants

- have gained knowledge and understanding for the activities of the consulting process in general,
- have gained function-specific knowledge and understanding of IT consulting,
- have an overview about consulting companies,
- know concrete consulting examples,
- have experienced how effective teams work and
- have got an insight into the professional field “consulting”.

Organizational issues

Die Teilnehmeranzahl ist limitiert. Eine Anmeldung per Mail an sekretariat.boehm@ipd.kit.edu ist erforderlich.
6.32 Course: Data and Storage Management [T-INFO-101276]

**Responsible:** Prof. Dr. Bernhard Neumair

**Organisation:** KIT Department of Informatics

**Part of:** M-WIWI-101440 - Information Services in Networks

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6.33 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

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<td>Lecture (V)</td>
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**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:**

**Data Mining and Applications**

**2520375, SS 2020, 2/4 SWS, Language: German, Open in study portal**

**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


6.34 Course: Database Systems [T-INFO-101497]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:**  
- M-INFO-101178 - Communication and Database Systems  
- M-INFO-101235 - Introduction to Data and Information Management

**Type**  
Written examination

**Credits**  
4

**Recurrence**  
Each summer term

**Version**  
1

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6.35 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**  Written examination

**Credits**  4,5

**Recurrence**  Each summer term

**Version**  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.
### 6.36 Course: Deployment of Database Systems [T-INFO-101317]

<table>
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<td>M-INFO-101235 - Introduction to Data and Information Management</td>
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#### Events

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### 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

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| 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:

#### Derivatives

2530550, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Literature**


**Weiterführende Literatur:**

6.38 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

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**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:

**Design and Construction of Buildings**  
2586404, WS 20/21, 2 SWS, Language: German, [Open in study portal]

**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 [WW3BWLUO1] 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
6.39 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

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**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 design is recommended.

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

**Sustainability Assessment of Buildings**  
2585404, SS 2020, 2 SWS, Language: German, Open in study portal

**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 design is 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
### 6.40 Course: Digital Circuits Design [T-INFO-103469]

**Responsible:** Prof. Dr. Wolfgang Karl  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-102978 - Digital Circuits Design

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6.41 Course: Digital Services [T-WIWI-109938]

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

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

**Part of:** M-WIWI-101434 - eBusiness and Service Management  
M-WIWI-102752 - Fundamentals of Digital Service Systems

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**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

**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

6.42 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

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**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:

**Economics and Behavior**

2560137, WS 20/21, 2 SWS, Language: English, Open in study portal

**Lecture (V)**

**Content**

The course covers topics from behavioral economics with regard to contents and methods. In addition, the students gain insight into the design of economic experiments. Furthermore, the students will become acquainted with reading and critically evaluating current research papers in the field of behavioral economics.

The students

- gain insight into fundamental topics in behavioral economics;
- get to know different research methods in the field of behavioral economics;
- learn to critically evaluate experimental designs;
- get introduced to current research papers in behavioral economics;
- become acquainted with the technical terminology in English.

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

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

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

The lecture will be held in English.

**Recommendations:**

Basic knowledge of microeconomics and statistics are recommended. A background in game theory is helpful, but not absolutely necessary.
Literature
6.43 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-101431 - Economics
- M-WIWI-101528 - Orientation Exam

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**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 lecture. 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:

**Economics I: Microeconomics**
2610012, WS 20/21, 3 SWS, Language: German, Open in study portal

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

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

It is the main aim of this course to provide basic knowledge in economic modelling. In particular, the student should be able to analyze market processes and the determinants of market results. Furthermore, she should be able to evaluate the effects of economic policy measures on market behavior and propose alternative, more effective policy measures.

In particular, the student should learn

- to apply simple microeconomic concepts,
- to analyze the structure of real world economic phenomena,
- to judge the possible effects of economic policy measures on the behavior of economic agents (in simple decision problems),
- to suggest alternative policy measures,
- to analyze as a participant of a tutorial simple economic problems by solving written exercises and to present the results of the exercises on the blackboard,
- to become familiar with the basic literature on microeconomics.

The student should gain basic knowledge in order to help in practical problems

- to analyze the structure of microeconomics relationships and to present own problem solutions,
- solve simple economic decision problems.

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation. The main exam takes place subsequent to the lecture.

The re-examination is offered at the same examination period. Usually, only repeating candidates are entitled for taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

The total workload for this course is approximately 150 hours.

Literature

- H. Varian, Grundzüge der Mikroökonomik, 5. Auflage (2001), Oldenburg Verlag
- Pindyck, Robert S./Rubinfeld, Daniel L., Mikroökonomie, 6. Aufl., Pearson. Münschen, 2005
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

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

**Events**

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**Competence Certificate**

The assessment consists of a 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:

**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**

- Schneeweß: Ökonometrie ISBN 3-7908-0008-2
### 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-101465 - Topics in Finance I
- M-WIWI-101423 - Topics in Finance II
- M-WIWI-101434 - eBusiness and Service Management

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<td>Übungen zu eFinance: Informationssysteme für den Wertpapierhandel</td>
<td>1 SWS</td>
<td>Practice (Ü)</td>
<td>Jaquart</td>
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**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:**

### eFinance: Information Systems for Securities Trading

2540454, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Lecture (V)**

**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


Further Literature

6.46 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

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**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:*

**Energy Policy**  
2581959, SS 2020, 2 SWS, Language: German, [Open in study portal]

**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.
6.47 Course: Enterprise Architecture Management [T-WIWI-102668]

**Responsible:** Prof. Dr. Thomas Wolf

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

**Part of:** M-WIWI-101476 - Business Processes and Information Systems

### Type
- Written examination

### Credits
- 4.5

### Recurrence
- Each winter term

### Version
- 2

**Competence Certificate**

Please note that the exam for first writers will be offered for the last time in winter semester 2019/2020. A last examination possibility exists in the summer semester 2020 (only for repeaters).

The assessment of this course is a written (60 min.) or (if necessary) oral examination (30 min.) according to §4(2) of the examination regulation.

**Prerequisites**

None
### 6.48 Course: Exercises in Civil Law [T-INFO-102013]

**Responsible:** Prof. Dr. Thomas Dreier  
Dr. Yvonne Matz  

**Organisation:** KIT Department of Informatics  

**Part of:** M-INFO-101191 - Commercial Law  

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### 6.49 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-101421 - Supply Chain Management  
- M-WIWI-101936 - Methodical Foundations of OR

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**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:*

**Facility Location and Strategic Supply Chain Management**  
2550486, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Literature**  
**Weiterführende Literatur:**
- Love, Morris, Wesołowsky: Facilities Location: Models and Methods, North Holland, 1988  

Responsible: Dr. Jan-Oliver Strych
Organisation: KIT Department of Informatics
KIT Department of Economics and Management
Part of: M-WIWI-101492 - Business Administration

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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:

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Literature
### 6.51 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

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</table>

**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:*

**Financial Accounting for Global Firms**  
2530242, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)  
Lecture (V)


**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**


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**6 COURSES**

**Course:** Financial Accounting for Global Firms [T-WIWI-107505]

**Information Engineering and Management B.Sc.**

Module Handbook as of 14/09/2020
### 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

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**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:**

### 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
Additional literature will be discussed in the lecture.
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

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**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:

**Financial Intermediation**

*2530232, WS 20/21, 2 SWS, Language: German, Open in study portal*

**Lecture (V)**

**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:**

- are in a position to describe the arguments for the existence of financial intermediaries,
- are able of 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:

6.54 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

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**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:

**Literature**

Weiterführende Literatur:

6.55 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

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<td>3 SWS</td>
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**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:

**Foundation 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 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**

Further literature will be made available in the lecture.
**6.56 Course: Foundations of Mobile Business [T-WIWI-104679]**

**Responsible:** Prof. Dr. Andreas Oberweis  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101476 - Business Processes and Information Systems

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**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.
### 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

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**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:*

#### 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.
6.58 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-101936 - Methodical Foundations of OR

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**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.
6.59 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-101936 - Methodical Foundations of OR

**Type**

Written examination

**Credits**

9

**Recurrence**

Each summer term

**Version**

1

**Comentence 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.
Course: Global Optimization II [T-WIWI-102727]

**Responsible:** Prof. Dr. Oliver Stein  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101936 - Methodical Foundations of OR

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**Competence Certificate**
Please note: due to the research semester of Prof. Dr. Stein the lecture will not be offered in summer semester 2020.

The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation. The examination is held in the semester of the lecture and in the following semester.

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

**Prerequisites**
None

**Annotation**
Part I and II of the lecture are held consecutively in the same semester.
6.61 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

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Events

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<td>Practice (Ü)</td>
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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]

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
6.62 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

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**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:*

**Industrial Organization**
2560238, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Literature**

**Verpflichtende Literatur:**

**Ergänzende Literatur:**
### 6.63 Course: Integrated Network and Systems Management [T-INFO-101284]

**Responsible:** Prof. Dr. Bernhard Neumair  
**Organisation:** KIT Department of Informatics  
**Part of:** M-WIWI-101440 - Information Services in Networks

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| Events |  |  |  |  |
|--------|--------|-----------------------------|---------|
| SS 2020 | 2400004 | Integrated Network and Systems Management | 2 SWS | Lecture (V) | Neumair |
6.64 Course: Intellectual Property and Data Protection [T-INFO-109840]

**Responsible:** Prof. Dr. Thomas Dreier
Dr. Johannes Eichenhofer

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-101253 - Intellectual Property and Data Protection

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**Events**

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6.65 Course: International Finance [T-WIWI-102646]

**Responsibility:** 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

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<td>2 SWS Lecture (V)</td>
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**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:

**International Finance**

**V** 2530570, SS 2020, 2 SWS, Language: German, Open in study portal

**Organizational issues**
Diese Veranstaltung findet im WS 20/21 statt.

**Literature**

Weiterführende Literatur:

**International Finance**

**V** 2530570, WS 20/21, 2 SWS, Language: German, Open in study portal

**Organizational issues**
Blockveranstaltung

am 11.11.20 15:45-19:00 Uhr Seminarraum 124 Geb. 09.21
Literature
Weiterführende Literatur:

6.66 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

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<td>International Marketing</td>
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<td>Lecture (V)</td>
<td>Feurer</td>
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**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:

**International Marketing**  
2572155, WS 20/21, 1 SWS, Language: English, Open in study portal  
Lecture (V)
Content

Doing marketing abroad creates a number of significant new challenges for firms. This class is intended to prepare you for meeting these challenges. In the first session, we will discuss the peculiarities of international marketing. The next five sessions will then be dedicated to methods that can be used to address them. For instance, we will look at the following issues:

- Internationalization strategies
- Market entry strategies
- Standardization vs. individualization (e.g. regarding products, prices, and communication)
- Measurement equivalence in international market research

In the final session, we will apply this knowledge to the case of Wal Mart. In particular, Wal Mart, despite being the largest retailing company worldwide, failed to successfully enter the German Market. We will discuss Wal Mart’s failure using the methods taught in the weeks before.

Students

- know the characteristics of international marketing
- are familiar with the Hofstede's cultural dimensions theory
- understand basic concepts of cultural learning (the concept of acculturation, the psychic distance paradox)
- know different concepts that explain international buying behavior (e.g. country-of-origin effects)
- comprehend different concepts for market entries in an international context ("waterfall"-strategy, "sprinkler"-strategy, method of analogy, chain ratio method)
- understand what needs to be considered regarding international market research (dealing with ethical dilemmas, challenges regarding primary and secondary data sources, testing measurement equivalence, linguistic equivalence, differences in the response styles of questionnaires)
- know the particularities of international product policy (standardization vs. differentiation, challenge of branding, fight against product plagiarism, brand counterfeiting and product piracy, protection of intellectual property)
- are familiar with the particularities in the international price policy (BigMac Index, how to deal with price demand functions to achieve profit maximization, arbitrage, price corridor, standardization vs. differentiation of prices, how to deal with currency risks, inflation, exchange rates and different willingness to pay)
- know the characteristics of the international communication policy (different laws, problems regarding international standardized campaigns)
- know particularities of the international sales policy (international channels, differences of contract negotiations)
- are able to organize international marketing departments and subsidiaries
- know the problems of marketing in emerging markets

The assessment consists of a written exam (60 minutes) (following §4(2), 1 of the examination regulation).

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

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

Literature

**6.67 Course: Internship [T-WIWI-103093]**

**Responsible:** Studiendekan der KIT-Fakultät für Informatik  
Studiendekan der KIT-Fakultät für Wirtschaftswissenschaften

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

**Part of:** M-WIWI-101433 - Internship

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**Competence Certificate**
see module description

**Prerequisites**
see module description

**Annotation**
see module description
6.68 Course: Introduction in Computer Networks [T-INFO-102015]

**Responsible:** Prof. Dr. Martina Zitterbart

**Organisation:** KIT Department of Informatics

**Part of:**
- M-INFO-101178 - Communication and Database Systems
- M-INFO-101194 - Telematics

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6.69 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

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<td>2581011</td>
<td>Übungen zu Einführung in die Energiewirtschaft</td>
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<td>Practice (Ü)</td>
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**Competence Certificate**  
The assessment consists of a written exam (90 min.) according to § 4 paragraph 2 Nr. 1 of the examination regulation.

**Prerequisites**  
None.

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

**Introduction to Energy Economics**  
2581010, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**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:**

- Feess, Eberhard. Umweltökonomie und Umweltpolitik. ISBN 3-8006-2187-8  
T 6.70 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

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**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.

**Recommendation**
Basic knowledge of mathematics and statistics is assumed.

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

**Introduction to Game Theory**

2520525, SS 2020, 2 SWS, Language: German, Open in study portal

**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:**

**Additional Literature:**
Literature
Verpflichtende Literatur:

Ergänzende Literatur:
6.71 Course: Introduction to Information Engineering and Management [T-WIWI-102757]

**Responsible:** Prof. Dr. Andreas Geyer-Schulz  
Prof. Dr. Christof Weinhardt

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

**Part of:** M-WIWI-101491 - Foundations in Business Administration

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**Competence Certificate**  
Oral examination

**Prerequisites**  
None
6.72 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

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

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

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

**Prerequisites**
None

**Recommendation**
Mathematics I und II. Programming knowledge for computing exercises.

It is strongly recommended to attend the course Introduction to Operations Research I [2550040] before attending the course Introduction to Operations Research II [2530043].

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

### 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.
Introduction to Operations Research II
2530043, WS 20/21, 2 SWS, Language: German, Open in study portal

Lecture (V)

Content
Integer and Combinatorial Programming: Basic notions, cutting plane methods, branch and bound methods, branch and cut methods, heuristics.
Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.
Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dynaical 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
6.73 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

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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]

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:
### Course: Introduction to Stochastic Optimization [T-WIWI-106546]

**Responsible:** Prof. Dr. Steffen Rebennack  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-103337 - Optimization under Uncertainty

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**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.
6.75 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

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**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]

**Literature**

Weiterführende Literatur:


Responsible: Prof. Dr. Hannes Hartenstein
Organisation: KIT Department of Informatics
Part of: M-INFO-100786 - IT-Security Management for Networked Systems

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6.77 Course: Lab: Working with Database Systems [T-INFO-103552]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm

**Organisation:** KIT Department of Informatics

**Part of:**
- M-INFO-101193 - Foundations of Information Systems
- M-INFO-101229 - Database Systems in Theory and Practice
- M-INFO-101235 - Introduction to Data and Information Management

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6.78 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

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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:

**Logistics and Supply Chain Management**

2581996, SS 2020, 2 SWS, Language: English, [Open in study portal]

Content

Students are introduced to the methods and tools of logistics and supply chain management. They 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.
6.79 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

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**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:*

**Macroeconomic Theory**

2560404, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

**Literature**

Literatur und Skripte werden in der Veranstaltung angegeben.
6.80 Course: Management and Strategy [T-WIWI-102629]

Responsibility: Prof. Dr. Hagen Lindstädt
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101425 - Strategy and Organization

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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.
Literatur


Die relevanten Auszüge und zusätzliche Quellen werden in der Veranstaltung bekannt gegeben.
6.81 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

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**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:**

**Managing Organizations**

2577902, WS 20/21, 2 SWS, Language: German, [Open in study portal]

**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


Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.
6.82 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

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**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:

**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**

6.83 Course: Mathematics I for Information Engineering and Management - Exam [T-MATH-102266]

**Responsible:** Prof. Dr. Andreas Rieder  
Dr. Daniel Weiß  
Prof. Dr. Christian Wieners

**Organisation:** KIT Department of Mathematics

**Part of:** M-MATH-101311 - Mathematics I

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6.84 Course: Mathematics I for Information Engineering and Management - Exercise [T-MATH-102267]

**Responsible:** Prof. Dr. Andreas Rieder  
Dr. Daniel Weiß  
Prof. Dr. Christian Wieners

**Organisation:** KIT Department of Mathematics

**Part of:** M-MATH-101311 - Mathematics I

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200
6.85 Course: Mathematics II for Information Engineering and Management - Exam [T-MATH-102269]

**Responsible:** Prof. Dr. Andreas Rieder
Dr. Daniel Weiß
Prof. Dr. Christian Wieners

**Organisation:** KIT Department of Mathematics

**Part of:** M-MATH-101312 - Mathematics II

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201
6.86 Course: Mathematics II for Information Engineering and Management - Exercise [T-MATH-102268]

**Responsible:** Prof. Dr. Andreas Rieder
Dr. Daniel Weiß
Prof. Dr. Christian Wieners

**Organisation:** KIT Department of Mathematics

**Part of:** M-MATH-101312 - Mathematics II

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6.87 Course: Mechanisms and Applications of Workflow Systems [T-INFO-101257]

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**Responsible:** Jutta Mülle  
**Organisation:** KIT Department of Informatics  
**Part of:**  
- M-INFO-101193 - Foundations of Information Systems  
- M-INFO-101193 - Foundations of Information Systems  
- M-INFO-101235 - Introduction to Data and Information Management

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

### Content

The lecture addresses various engineering and algorithmic aspects and topics in robotics which are illustrated and explained based on examples originating from current research conducted in the field of humanoid robotics. First, this lecture gives an introduction into the mathematical fundamentals which are needed to describe a robotic system as well as the basic algorithms commonly applied in motion planning.

Subsequently, models and methods are introduced with which dynamical systems can be formalized and which can be used to encode and represent robot actions. To do so, we will discuss linear time-invariant systems in state.

### Learning Objectives:

Based on the example of robotics students understand the synergistic effects and interdisciplinarity of mechatronics and informatics, the embedded systems, the control, and the methods and the algorithms. They are acquainted with the basic terminology and the methods which are common in robotics, signal processing, action representation, machine learning and cognitive systems. They are capable of applying fundamental state-of-the-art methods and tools for the development and programming of robots. Based on examples originating from current research conducted in the fields of humanoid robotics, the students interactively learn how to identify and formalize problems and tasks and how to develop solutions in an analytical and goal-directed way.

### Organizational issues

Zugehörige Veranstaltungen: Empfehlung - Basispraktikum Mobile Roboter

Die Erfolgskontrolle erfolgt in Form einer schriftlichen Prüfung in englischer Sprache im Umfang von i.d.R. 60 Minuten nach § 4 Abs. 2 Nr. 1 SPO.

Arbeitsaufwand:

2h Präsenz
+ 2*2h = 4h Vor/Nachbereitung
+ 30h Prüfungsvorbereitung
120h
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<thead>
<tr>
<th>Responsible:</th>
<th>Prof. Dr.-Ing. Michael Beigl</th>
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<tr>
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<td>KIT Department of Informatics</td>
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<tr>
<td>Part of:</td>
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<td>2400051</td>
<td>Mobile Computing and Internet of Things</td>
<td>2+1 SWS Lecture / Practice (VÜ) Beigl, Exler</td>
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</table>
6.90 Course: Mobile Robots – Practical Course [T-INFO-101992]

Responsible: Prof. Dr.-Ing. Tamim Asfour
Organisation: KIT Department of Informatics
Part of: M-INFO-101184 - Mobile Robots – Practical Course

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Events

SS 2020 24624 Mobile Robots - Practical Course 4 SWS Practical course (P) Asfour

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

Content
In this practical course, students assemble an ASURO robot in groups of two. Each student will be provided with his own robot, which he has to put into operation. While using the robots, a new set of problems will be solved each week. The students will need to prepare for each weak given the provided material. Sets of problem be solved using the C language and focus on controlling the robot’s sensors and actuators as well as on the generation of reflex-based behavior. The course ends with a race, where the robots have to tackle an obstacle course.

Learning Objectives:
The student is able to understand circuit diagrams and can assemble, test and debug complex PCBs. The student is familiar with programming microcontroller-based embedded systems using the C language and cross compilers. The student is able to use methods for controlling robotic sensors and actuators, can conduct experiments with robots and solve tasks in this context independently and in small groups.

Organizational issues
Die Erfolgskontrolle erfolgt nach § 4 Abs. 2 Nr. 3 SPO als Erfolgskontrolle anderer Art und besteht aus mehreren Teilaufgaben. Die Bewertung erfolgt mit den Noten "bestanden" / "nicht bestanden".

Voraussetzungen: Kenntnisse in der Programmiersprache C und in der Technischen Informatik werden vorausgesetzt.
Arbeitsaufwand: 120 h

Modul für Bachelor Maschinenbau, Mechatronik und Informationstechnik, Elektrotechnik und Informationstechnik
**6.91 Course: Modeling and OR-Software: Introduction [T-WIWI-106199]**

**Responsible:** Prof. Dr. Stefan Nickel  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-WIWI-101413 - Applications of Operations Research

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

**Events**

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**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:*

**Modellieren und OR-Software: Einführung**  
2550490, SS 2020, 3 SWS, Language: German, [Open in study portal]

**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.
6.92 Course: Nonlinear Optimization I [T-WIWI-102724]

**Responsible:** Prof. Dr. Oliver Stein

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

**Part of:**
- M-WIWI-101936 - Methodical Foundations of OR
- M-WIWI-103337 - Optimization under Uncertainty

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**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:

**Nonlinear Optimization I**

Coursenumber: 2550111, WS 20/21, 2 SWS, Language: German, Open in study portal

**Lecture (V)**

**Content**
The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**
The treatment of optimization problems with constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively in the same semester.

**Learning objectives:**
The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.
Literature
O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
### 6.93 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-101936 - Methodical Foundations of OR

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**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

**V 2550111, WS 20/21, 2 SWS, Language: German, Open in study portal**

**Lecture (V)**

**Content**

The lecture treats the minimization of smooth nonlinear functions without constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Introduction, examples, and terminology
- Existence results for optimal points
- First and second order optimality conditions
- Algorithms (line search, steepest descent method, variable metric methods, Newton method, Quasi Newton methods, CG method, trust region method)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

**Remark:**

The treatment of optimization problems with constraints forms the contents of the lecture "Nonlinear Optimization II". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively in the same semester.

**Learning objectives:**

The student

- knows and understands fundamentals of unconstrained nonlinear optimization,
- is able to choose, design and apply modern techniques of unconstrained nonlinear optimization in practice.
Literature
O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:
- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993

Nonlinear Optimization II
2550113, WS 20/21, 2 SWS, Language: German, Open in study portal

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
6 COURSES

Course: Nonlinear Optimization II [T-WIWI-102725]

6.94 Course: Nonlinear Optimization II [T-WIWI-102725]

**Responsible:** Prof. Dr. Oliver Stein

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

**Part of:** M-WIWI-101936 - Methodical Foundations of OR

### Type

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### 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:

### Nonlinear Optimization II

2550113, WS 20/21, 2 SWS, Language: German, [Open in study portal]

**Lecture (V)**

### Content

The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, optimality conditions are derived and, based on them, solution algorithms are developed. The lecture is structured as follows:

- Topology and first order approximations of the feasible set
- Theorems of the alternative, first and second order optimality conditions
- Algorithms (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by exercises which, amongst others, offers the opportunity to implement and to test some of the methods on practically relevant examples.

### Remark:

The treatment of optimization problems without constraints forms the contents of the lecture "Nonlinear Optimization I". The lectures "Nonlinear Optimization I" and "Nonlinear Optimization II" are held consecutively in the same semester.

### Learning objectives:

The student

- knows and understands fundamentals of constrained nonlinear optimization,
- is able to choose, design and apply modern techniques of constrained nonlinear optimization in practice.
Literature
O. Stein, Grundzüge der Nichtlinearen Optimierung, SpringerSpektrum, 2018

Weiterführende Literatur:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
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

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**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.

**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

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**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**

- **Event Code:** 2573001  
- **Year:** SS 2020  
- **SWS:** 2  
- **Language:** German  
- **Open in study portal**

**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**

6.97 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

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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)

Literature

6.98 Course: Practical Course: Lego Mindstorms [T-INFO-107502]

**Responsible:** Prof. Dr.-Ing. Tamim Asfour

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-102557 - Lego Mindstorms - Practical Course

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<td>Lego Mindstorms - Laboratory</td>
<td>3 SWS</td>
<td>Practical course (P)</td>
<td>Asfour</td>
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</table>

**Recommendation**

Basic knowledge in JAVA is necessary for successful completion of this course.

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

**V Lego Mindstorms - Laboratory**

24306, WS 20/21, 3 SWS, Language: German, [Open in study portal]

**Practical course (P)**

**Content**

In this practical course, teams of three students build and program a mobile robot using Lego Mindstorms and the Java programming language. The robots are challenged to complete a versatile parkour including sections like the traversal of a maze, following a line, crossing a bridge or avoiding obstacle. After initial building of the robots, a section of the parkour will be set up each week and tackled by the robots, for which the students have to prepare their code beforehand. A final race of the robots on the entire parkour will be held at the end of the semester.

**Learning Objectives:**

The participants are able to design and construct a robot with motors and sensors using the Lego Mindstorms kit. The students are familiar with programming the Lego EV3 components using the Java programming language. They are able to understand and solve several key problems in mobile robotics, such as autonomous navigation, detection of landmarks and objects as well as obstacle avoidance. The students know how to efficiently and independently solve problems in a small group in a given time frame and are able to systematically document their work and results.

**Organizational issues**

Das Praktikum findet wöchentlich statt.

Nachweis: Die Erfolgskontrolle wird in der Modulbeschreibung erläutert.

Ansprechpartner: Pascal Weiner

E-Mail: pascal.weiner@kit.edu

**Empfehlung:**

Grundlegende Kenntnisse in Java sind hilfreich, aber nicht zwingend erforderlich. / Basic knowledge in JAVA is helpful but not required.

**Arbeitsaufwand:** 120 h

**Beschreibung:**

Die Aufgabenstellungen des Praktikums reichen von Aufbau und Programmierung der Lego EV3-Bausteine mit der Programiersprache JAVA bis hin zur Lösung spezieller Aufgaben, die im Rahmen eines abschließenden Wettrennens zu lösen sind (Linien folgen, Hindernissen ausweichen, Bahnplanung).

**Literature**

Wird in der Veranstaltung bekannt gegeben.
### 6.99 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

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#### Events

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**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.
6.100 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

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**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:

**Problem solving, communication and leadership**

Lecture (V)

<table>
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</table>

**Content**

The course deals with various aspects of problem solving and communication processes and is divided into two parts. The first part of the course addresses the fundamental steps in the problem-solving process; namely, problem identification, problem structuring, problem analysis and communication of solution. Ideas for structuring problem solving processes will be discussed and the perquisites for and principles of structured communication based on charts and presentations will be explained. The second part of the course addresses important concepts in leadership, including the context-specificity of influence, the choice of leader and the characteristics of employees. The course content reflects current issues in management and communication practice and is oriented toward the practical application of theoretical insights to these issues. In this respect, the course aims to develop interdisciplinary skills.

**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.
Literatur
Verpflichtende Literatur:
Die relevanten Auszüge und zusätzlichen Quellen werden in der Veranstaltung bekannt gegeben.

Ergänzende Literatur:
- 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
6 COURSES

Course: Process Mining [T-WIWI-109799]

Responsible: Prof. Dr. Andreas Oberweis
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

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Events

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Competence Certificate

The assessment of this course is a written examination (60 min) according to §4(2), 1 of the examination regulation in the first week after lecture period.

Prerequisites

None

Annotation

Former name (up to winter semester 2018/2019) "Workflow Management".

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

Process Mining

2511204, SS 2020, 2 SWS, Language: German, Open in study portal

Content

The area of process mining covers approaches which aim at deducting new knowledge on the basis of logfiles generated by information systems. Such information systems are e.g., workflow-management-systems which are used for an efficient control of processes in enterprises and organisations. The lecture introduces the foundations of processes and respective modeling and analysis techniques. In the following, the foundations of process mining and the three classical types of approaches - discovery, conformance and enhancement - will be taught. In addition to the theoretical basics, tools, application scenarios in practice and open research questions are covered as well.

Learning objectives:

Students

- understand the concepts and approaches of process mining and know how they are applied,
- create and evaluate business process models,
- analyze static and dynamic properties of workflows,
- apply approaches and tools of process mining.

Recommendations:

Knowledge of course Applied Informatics - Modelling is expected.

Workload:

- Lecture 30h
- Exercise 15h
- Preparation of lecture 24h
- Preparation of exercises 25h
- Exam preparation 40h
- Exam 1h
Literature


Weitere Literatur wird in der Vorlesung bekannt gegeben.
### 6.102 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

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<td>Production Economics and Sustainability</td>
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**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:**

### Production Economics and Sustainability

**2581960, WS 20/21, 2 SWS, Language: German, Open in study portal**

**Lecture (V)**

**Content**

The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.

**Topics:**

- regulations related to materials and substances  
- raw materials, reserves and their availabilities/lifetimes  
- material and substance flow analysis (MFA/SFA)  
- material related ecoprofiles, e.g. Carbon Footprint  
- LCA  
- resource efficiency  
- emission abatement  
- waste management and closed-loop recycling  
- raw material oriented production systems  
- environmental management (EMAS, ISO 14001, Ecoproof), eco-controlling

**Literature**

wird in der Veranstaltung bekannt gegeben
### 6.103 Course: Programming [T-INFO-101531]

**Responsible:** Prof. Dr.-Ing. Anne Koziolęk  
Prof. Dr. Ralf Reussner

**Organisation:** KIT Department of Informatics

**Part of:**  
M-INFO-101174 - Programming  
M-WIWI-101528 - Orientation Exam

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**6.104 Course: Programming Pass [T-INFO-101967]**

**Responsible:** Prof. Dr.-Ing. Anne Koziolek  
Prof. Dr. Ralf Reussner

**Organisation:** KIT Department of Informatics

**Part of:**  
- M-INFO-101174 - Programming  
- M-WIWI-101528 - Orientation Exam

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6.105 Course: Project Management in Practice [T-INFO-101976]

**Responsible:** Prof. Dr.-Ing. Klemens Böhm

**Organisation:** KIT Department of Informatics

**Part of:**
- M-INFO-101193 - Foundations of Information Systems
- M-INFO-101235 - Introduction to Data and Information Management

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

**Project Management in Practice**
2400019, SS 2020, 2 SWS, Language: German, [Open in study portal](#)

**Lecture (V)**

**Content**

At the end of the course, the participants:

- Know the principles of project management and are able to make use of them in real-world case studies.
- Have profound knowledge about project phases, principles of project planning, fundamental elements such as project charter & scope definitions, descriptions of project goals, activity planning, milestones, project-structure plans, agenda and cost planning and risk management. Further, they know principle elements of project implementation, crisis management, escalation and, last but not least, project-termination activities.
- Understand and are able to adopt the fundamentals of planning as well as the subjective factors which are relevant in a project. This includes topics such as communication, group processes, teambuilding, leadership, creative solution methods and risk-assessment methods.

The following key skills are taught:

- Project planning
- Project control
- Communication
- Leadership behavior
- Crisis management
- Identification of and solutions of difficult situations
- Team building
- Motivation (of oneself and of others)

**Organizational issues**

Die Plätze sind begrenzt und die Anmeldung findet durch das Sekretariat Prof. Böhm statt.
### 6.106 Course: Public Law I & II [T-INFO-110300]

**Responsible:** Dr. Johannes Eichenhofer  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101192 - Constitutional and Administrative Law

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Information Engineering and Management B.Sc.  
Module Handbook as of 14/09/2020
6.107 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

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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:

Public Revenues
2560120, SS 2020, 2 SWS, Language: German, Open in study portal

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

**6.108 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

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| Events | 2560136, WS 20/21, 3 SWS, Language: German, Open in study portal | Lecture (V) | Wigger, Groh |

**Competence Certificate**  
The assessment consists of a written exam (60 min.).

**Prerequisites**  
T-WIWI-107763 "Municipal Finance" must not be selected.

**Annotation**  
Previous title until winter semester 2018/19 "Municipal Finance".

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

**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**

- Diverse Veröffentlichungen des Innenministeriums und Finanzministeriums Baden-Württemberg.
6.109 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

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**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)**

**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:

6.110 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

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<td>Written examination</td>
<td>4.5</td>
<td>Each summer term</td>
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**Events**

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<tr>
<th>SS 2020</th>
<th>2585400</th>
<th>Real Estate Management II</th>
<th>2 SWS</th>
<th>Lecture (V)</th>
<th>Lützkendorf, Worschech</th>
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<tr>
<td>SS 2020</td>
<td>2585401</td>
<td>Übung zu Real Estate Management II</td>
<td>2 SWS</td>
<td>Practice (Ü)</td>
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</tbody>
</table>

**Competence Certificate**

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

**Prerequisites**

None

**Recommendation**

A combination with the module *Design Construction and Assessment of Green Buildings I* is recommended. Furthermore it is 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:*

**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 takes place (summer semester). Reexaminations are offered at every ordinary examination date.

Literature
Weiterführende Literatur:
6 COURSES


Responsible: PD Dr. Patrick Jochem
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101464 - Energy Economics

<table>
<thead>
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Events

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<th>Recurrence</th>
<th>Version</th>
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<tr>
<td>WS 20/21</td>
<td>2581012</td>
<td>Renewable Energy – Resources, Technologies and Economics</td>
<td>2 SWS Lecture (V) Jochem</td>
</tr>
</tbody>
</table>

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:

Renewable Energy – Resources, Technologies and Economics

2581012, WS 20/21, 2 SWS, Language: English, Open in study portal

Lecture (V)

Content

1. General introduction: Motivation, Global situation
2. Basics of renewable energies: Energy balance of the earth, potential definition
3. Hydro
4. Wind
5. Solar
6. Biomass
7. Geothermal
8. Other renewable energies
9. Promotion of renewable energies
10. Interactions in systemic context
11. Excursion to the "Energieberg" in Mühlburg

Learning Goals:

The student

- understands the motivation and the global context of renewable energy resources.
- gains detailed knowledge about the different renewable resources and technologies as well as their potentials.
- understands the systemic context and interactions resulting from the increased share of renewable power generation.
- understands the important economic aspects of renewable energies, including electricity generation costs, political promotion and marketing of renewable electricity.
- is able to characterize and where required calculate these technologies.

Organizational issues

siehe Institutsaushang
Literature
Weiterführende Literatur:

6.112 Course: Security [T-INFO-101371]

**Responsible:** Prof. Dr. Dennis Hofheinz
Prof. Dr. Jörn Müller-Quade

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-100834 - Security

<table>
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<td>24941</td>
<td>Security</td>
<td>3 SWS</td>
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<td></td>
<td>Lecture (V)</td>
<td>Müller-Quade, Strufe</td>
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</table>
### Course: Selling IT-Solutions Professionally [T-INFO-101977]

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**Responsible:** Prof. Dr.-Ing. Klemens Böhm  
**Organisation:** KIT Department of Informatics  
**Part of:**  
M-INFO-101193 - Foundations of Information Systems  
M-INFO-101235 - Introduction to Data and Information Management
6.114 Course: Semantic Web Technologies [T-WIWI-110848]

Responsible: Prof. Dr. York Sure-Vetter
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101438 - Semantic Knowledge Management
M-WIWI-101440 - Information Services in Networks

<table>
<thead>
<tr>
<th>Type</th>
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<td>Written exam</td>
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<td>Each summer term</td>
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</table>

Events

| SS 2020   | 2511310 | Semantic Web Technologies | 2 SWS | Lecture (V) | Sure-Vetter, Acosta Deibe, Käfer |
| SS 2020   | 2511311 | Exercises to Semantic Web Technologies | 1 SWS | Practice (Ü) | Sure-Vetter, Acosta Deibe, Käfer |

Competence Certificate
The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.
The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites
None

Recommendation
Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required.

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

V Semantic Web Technologies
2511310, SS 2020, 2 SWS, Language: English, Open in study portal Lecture (V)
Content
The aim of the Semantic Web is to make the meaning (semantics) of data on the web usable in intelligent systems, e.g. in e-commerce and internet portals.

Central concepts are the representation of knowledge in form of RDF and ontologies, the access via Linked Data, as well as querying the data by using SPARQL. This lecture provides the foundations of knowledge representation and processing for the corresponding technologies and presents example applications.

The following topics are covered:

- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Learning objectives:
The student

- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Recommendations:
Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

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

Literature


Weitere Literatur


Exercises to Semantic Web Technologies
2511311, SS 2020, 1 SWS, Language: English, Open in study portal
Content
The exercises are related to the lecture Semantic Web Technologies.
Multiple exercises are held that capture the topics, held in the lecture Semantic Web Technologies, and discuss them in detail. Thereby, practical examples are given to the students in order to transfer theoretical aspects into practical implementation.
The following topics are covered:
- Resource Description Framework (RDF) and RDF Schema (RDFS)
- Web Architecture and Linked Data
- Web Ontology Language (OWL)
- Query language SPARQL
- Rule languages
- Applications

Learning objectives:
The student
- understands the motivation and foundational ideas behind Semantic Web and Linked Data technologies, and is able to analyse and realise systems
- demonstrates basic competency in the areas of data and system integration on the web
- masters advanced knowledge representation scenarios involving ontologies

Recommendations:
Lectures on Informatics of the Bachelor on Information Systems (Semester 1-4) or equivalent are required. Knowledge of modeling with UML is required.

Literature

Weitere Literatur
<table>
<thead>
<tr>
<th>Course</th>
<th>Type</th>
<th>Credits</th>
<th>Recurrence</th>
<th>Version</th>
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<td>Seminar in Business Administration (Bachelor)</td>
<td>Examination of another type</td>
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<td>Each term</td>
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### Events

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<th>Title</th>
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<tbody>
<tr>
<td>SS 2020</td>
<td>2530293</td>
<td>Seminar in Finance (Bachelor, Prof. Ruckes)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Ruckes, Luedecke, Hoang, Benz, Schubert, Strych, Silbereis</td>
</tr>
<tr>
<td>SS 2020</td>
<td>2530374</td>
<td>Data-Driven Investments</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Ulrich</td>
</tr>
<tr>
<td>SS 2020</td>
<td>2530580</td>
<td>Seminar in Finance</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Uehrig-Homburg, Eska, Schuster, Eberbach, Reichenbacher</td>
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<tr>
<td>SS 2020</td>
<td>2540524</td>
<td>Bachelorseminar aus Data Science</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Geyer-Schulz, Schweiger, Schweizer</td>
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<tr>
<td>SS 2020</td>
<td>2545010</td>
<td>Entrepreneurship Basics (Track 1)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Lau, Terzidis</td>
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<tr>
<td>SS 2020</td>
<td>2545011</td>
<td>Entrepreneurship Basics (Track 2)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Terzidis, Böhrer</td>
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<tr>
<td>SS 2020</td>
<td>2571180</td>
<td>Seminar in Marketing und Vertrieb (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Klarmann, Mitarbeiter, Feurer</td>
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<td>Seminar in Marketing und Vertrieb (Master)</td>
<td>2 SWS</td>
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<tr>
<td>SS 2020</td>
<td>2573010</td>
<td>Seminar Human Resources and Organizations (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Nieken, Mitarbeiter</td>
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<td>SS 2020</td>
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<td>Seminar Human Resource Management (Bachelor)</td>
<td>2 SWS</td>
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<td>Seminar Management Accounting</td>
<td>2 SWS</td>
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<td>SS 2020</td>
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<td>Seminar in Management Accounting - Special Topics</td>
<td>2 SWS</td>
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<tr>
<td>SS 2020</td>
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<td>2 SWS</td>
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<tr>
<td>SS 2020</td>
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<td>Seminar Energiewirtschaft II</td>
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<td>Machine Learning for Business Applications</td>
<td>2 SWS</td>
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<td>2530580</td>
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<td>2 SWS</td>
<td>Seminar (S)</td>
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<td>WS 20/21</td>
<td>2530610</td>
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<td>2 SWS</td>
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<td>WS 20/21</td>
<td>2540473</td>
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<td>WS 20/21</td>
<td>2540475</td>
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<td>Digital Experience and Participation</td>
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<td>WS 20/21</td>
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</table>

**Cometence 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/](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](https://portal.wiwi.kit.edu)

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

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**Data-Driven Investments**

2530374, SS 2020, 2 SWS, Language: English, [Open in study portal](https://portal.wiwi.kit.edu)
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

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

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
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

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 Rechnungsweisen" (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

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

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

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
Blücherstr. 17, E009; Blockseminar tba

Data Science in Service Management
2540473, WS 20/21, 2 SWS, Language: German/English, Open in study portal

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

Content
wird auf deutsch und englisch gehalten

Organizational issues
Blockveranstaltung, siehe WWW

Entrepreneurship Basics (Track 1)
2545010, WS 20/21, 2 SWS, Language: German, Open in study portal

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

Content
wird auf deutsch und englisch gehalten

Organizational issues
Blockveranstaltung, siehe WWW

Literature
Weiterführende Literatur:

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

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
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

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.
6 COURSES

Course: Seminar in Economics (Bachelor) [T-WIWI-103487]

<table>
<thead>
<tr>
<th>Type</th>
<th>Credits</th>
<th>Recurrence</th>
<th>Version</th>
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<tr>
<td>Examination of another type</td>
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<td>Each term</td>
<td>1</td>
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</table>

**Responsibility:** Professorenschaft des Fachbereichs Volkswirtschaftslehre

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

**Part of:** M-WIWI-101826 - Seminar Module Economic Sciences

**Events**

<table>
<thead>
<tr>
<th>Semester</th>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Type</th>
<th>Lecturer</th>
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<tbody>
<tr>
<td>SS 2020</td>
<td>2560241</td>
<td>Digital IT Solutions and Services transforming the Field of Public Transportation</td>
<td>2 SWS</td>
<td>Prüfung (PR)</td>
<td>Janoshalmi</td>
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<tr>
<td>SS 2020</td>
<td>2560554</td>
<td>Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Szech, Zhao</td>
</tr>
<tr>
<td>SS 2020</td>
<td>2560556</td>
<td>Designing the Digital Economy, Topics on Political Economy (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Szech, Huber</td>
</tr>
<tr>
<td>WS 20/21</td>
<td>2521310</td>
<td>Topics in Econometrics</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Schienle, Chen, Görgen, Krüger, Buse</td>
</tr>
<tr>
<td>WS 20/21</td>
<td>2560140</td>
<td>Topics in Political Economy (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Szech, Huber</td>
</tr>
<tr>
<td>WS 20/21</td>
<td>2560141</td>
<td>Morals &amp; Social Behavior (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Szech, Zhao</td>
</tr>
<tr>
<td>WS 20/21</td>
<td>2560142</td>
<td>Topics in Political Economy (Master)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Szech, Huber</td>
</tr>
<tr>
<td>WS 20/21</td>
<td>2561208</td>
<td>Ausgewählte Aspekte der europäischen Verkehrsplanung und -modellierung</td>
<td>1 SWS</td>
<td>Seminar (S)</td>
<td>Szimba</td>
</tr>
</tbody>
</table>

**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:

**Fighting Climate Change, Seminar on Morals and Social Behavior (Bachelor)**

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 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

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)
2560556, SS 2020, 2 SWS, Language: English, Open in study portal

Topics in Econometrics
2521310, 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)
2560140, 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.

Objective: The student develops an own idea for an economic experiment in this research direction. Students work in groups. Changing topics each semester. For current topics, see http://polit.econ.kit.edu or https://portal.wiwi.kit.edu/Seminare

Seminar Papers of 8–10 pages are to be handed in.

For bachelor students grades will be based on the quality of presentations in the seminar (50%) and the seminar paper (50%). Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

Morals & Social Behavior (Bachelor)
2560141, 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 presentations in the seminar (50%) and the seminar paper (50%).

For Master students, grades will be based on the quality of presentations in the seminar (40%) and the seminar paper (40%). Additionally Master students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade.

Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.

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

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 presentations in the seminar (40%) and the seminar paper (40%). Additionally students will have to hand in two abstracts with their paper – one with a maximum length of 100 words and one with a maximum length of 150 words. The quality of abstracts will reflect with 20% in the final grade. Students can improve their grades by 0.3 for good and constructive discussion contributions or by 0.7 for excellent and constructive discussion contributions.

Recommendation: Knowledge in the field of experimental economic research or behavioral economics as well as in the field of microeconomics and game theory may be helpful.
### Course: Seminar in Informatics (Bachelor) [T-WIWI-103485]

**Responsible:** Professorenschaft des Fachbereichs Informatik  
**Organisation:** KIT Department of Economics and Management  
**Part of:** M-INFO-102058 - Seminar Module Informatics

<table>
<thead>
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<th>Events</th>
<th>Type</th>
<th>Credits</th>
<th>Recurrence</th>
<th>Version</th>
<th>TWS</th>
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</thead>
<tbody>
<tr>
<td>SS 2020</td>
<td>Seminar Business Information Systems: Artificial Intelligence and Robotic Process Automation (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Oberweis, Alpers, Goranov</td>
<td></td>
</tr>
<tr>
<td>SS 2020</td>
<td>Seminar Knowledge Discovery and Data Mining (Bachelor)</td>
<td>3 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Herbold, Färber, Nguyen, Noullet, Saier</td>
<td></td>
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<tr>
<td>SS 2020</td>
<td>Seminar Data Science &amp; Real-time Big Data Analytics (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Riemer, Zehnder</td>
<td></td>
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<tr>
<td>SS 2020</td>
<td>Emerging Trends in Internet Technologies (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Lins, Sunyaev, Thiebes</td>
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</tr>
<tr>
<td>SS 2020</td>
<td>Emerging Trends in Digital Health (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Lins, Sunyaev, Thiebes</td>
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<tr>
<td>SS 2020</td>
<td>Cognitive Automobiles and Robots</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Zöllner</td>
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<tr>
<td>SS 2020</td>
<td>Seminar Security, Usability and Society (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Volkamer, Aldag, Reinheimer, Mayer, Mossano, Düzgün</td>
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<tr>
<td>SS 2020</td>
<td>Seminar Service Science, Management &amp; Engineering</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Weinhardt, Nickel, Fichtner, Satzger, Sure-Vetter, Fromm</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Programming 3 (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Oberweis, Zöllner, Frister, Frösch, Struppek</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Information security and data protection (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Oberweis, Volkamer, Raabe, Aldag, Alpers, Düzgün, Mayer, Reinheimer, Schiefer, Wagner</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Data Science &amp; Real-time Big Data Analytics (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Kulbach, Riemer, Zehnder</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Data Science &amp; Real-time Big Data Analytics (Master)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Kulbach, Riemer, Zehnder</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Linked Data and the Semantic Web (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Acosta Deibe, Käfer, Heling</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Linked Data and the Semantic Web (Master)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Sure-Vetter, Acosta Deibe, Käfer, Heling</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Cognitive Automobiles and Robots (Master)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
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<tr>
<td>WS 20/21</td>
<td>Seminar Security, Usability and Society (Bachelor)</td>
<td>2 SWS</td>
<td>Seminar (S)</td>
<td>Volkamer, Aldag, Düzgün, Mayer, Mossano, Reinheimer</td>
<td></td>
</tr>
</tbody>
</table>
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](https://campus.kit.edu/)

**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**

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

**Seminar Data Science & Real-time Big Data Analytics (Bachelor)**

2513310, SS 2020, 2 SWS, Language: English, [Open in study portal](https://campus.kit.edu/)
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

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
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

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
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 Data Science & Real-time Big Data Analytics (Bachelor)**
2513310, WS 20/21, 2 SWS, Language: English, [Open in study portal](#)

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 practical seminar is given under the following Link:
http://seminar-cep.fzi.de

Questions are answered via the e-mail address sem-ep@fzi.de.

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.

**Seminar Data Science & Real-time Big Data Analytics (Master)**
2513311, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)

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.

**Seminar Linked Data and the Semantic Web (Bachelor)**
2513312, WS 20/21, 2 SWS, Language: German/English, [Open in study portal](#)
Content
Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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.

V Seminar Linked Data and the Semantic Web (Master)
2513313, WS 20/21, 2 SWS, Language: German/English, Open in study portal

Content
Linked Data is a way of publishing data on the web in a machine-understandable fashion. The aim of this 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.

V Seminar Cognitive Automobiles and Robots (Master)
2513500, WS 20/21, 2 SWS, Language: German/English, Open in study portal
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.
6.118 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-101826 - Seminar Module Economic Sciences

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<td>SS 2020</td>
<td>2550491</td>
<td>Seminar: Modern OR and Innovative Logistics</td>
<td>2</td>
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<td>Nickel, Mitarbeiter</td>
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<td>WS 20/21</td>
<td>2550131</td>
<td>Seminar on Methodical Foundations of Operations Research</td>
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<td>Stein, Neumann</td>
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**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
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

Content
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.

Bachelor students are introduced to the style of scientific work. By 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 rhetoric abilities may be improved.

Remarks:
Attendance at all oral presentations is compulsory.
Preferably at least one module offered by the Institute of Operations Research should have been chosen before attending this seminar.

Assessment:
The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation. The grade is composed of the equally weighted assessments of the paper and the oral presentation.

The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the oral presentation.

Workload:
The total workload for this course is approximately 90 hours. For further information see German version.
Literature
Die Literatur und die relevanten Quellen werden gegen Ende des vorausgehenden Semesters im Wiwi-Portal und in einer Seminarvorbereitung bekannt gegeben.

References and relevant sources are announced at the end of the preceding semester in the Wiwi-Portal and in a preparatory meeting.

Seminar: Modern OR and Innovative Logistics
2550491, WS 20/21, 2 SWS, Language: German, Open in study portal

Content
The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management). The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic. Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

Organizational issues
wird auf der Homepage bekannt gegeben

Literature
Die Literatur und die relevanten Quellen werden zu Beginn des Seminars bekannt gegeben.
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-101826 - Seminar Module Economic Sciences

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**Events**

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<td>2521310</td>
<td>Topics in Econometrics</td>
<td>2</td>
<td>Seminar (S)</td>
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</table>

**Competence Certificate**

Alternative exam assessment (§ 4(2), 3 SPO 2015). The following aspects are included:

- Regular participation in the seminar dates
- Preparation of a seminar paper on a partial aspect of the seminar topic according to scientific methods
- Lecture on the topic of the seminar paper.

The point scheme for the assessment is determined by the lecturer of the respective course. It will be announced at the beginning of the course.

**Prerequisites**

None.

**Recommendation**

See seminar description in the course catalogue of the KIT (https://campus.kit.edu/)

**Annotation**

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

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

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

**Topics in Econometrics**

2521310, WS 20/21, 2 SWS, Language: German, [Open in study portal](#)

**Organizational issues**

Blockveranstaltung, Termine werden auf Homepage und über Ilias bekannt gegeben.
6.120 Course: Seminar Informatics A [T-INFO-104336]

**Type:** Examination of another type  
**Credits:** 3  
**Version:** 1

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<td>SS 2020 24344</td>
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Below you will find excerpts from events related to this course:

### Hot Topics in Bioinformatics

2400011, SS 2020, 2 SWS, Language: English, [Open in study portal]

**Seminar (S)**

**Content**  
**Prerequisites:** CS Master's level seminar. Participants must have attended and passed the course on "Introduction to Bioinformatics for Computer Scientists" in one of the preceding winter terms.

**Task:** You will need to select papers to present, give a presentation and write a report.

This main seminar allows students to understand and present the contents of current papers in Bioinformatics such as published for instance in the journals *Bioinformatics, BMC Bioinformatics, Journal of Computational Biology* etc. or at conferences such as ISMB or RECOMB.

We will provide a list of interesting papers, but students can also propose papers they are interested in. Students may also choose to cover broader topics of more general interest such as multiple sequence alignment, Bayesian phylogenetic inference, read assembly etc.

Each student will be assigned a lab member for help with understanding the article and preparing the slides as well as the report. Students should give a 35 minute presentation on their topic of choice and write a report (Seminararbeit) comprising 8 pages.

**Goals:** Participants are able to understand, critically assess, and compare current research papers in Bioinformatics. They are able to present algorithms and models from current research papers in oral and written form at a level that corresponds to that of scientific publications and conference presentations. Participants are able to suggest extension to current methods.

**Credits:** 3 ECTS

**Organizational issues**  
**IMPORTANT:** Register for the seminar mailing list by sending an email to Alexandros.Stamatakis@h-its.org.

All information on the seminar is provided at: Seminar page Information about how we will start virtually is also provided there. We will start in the first week of the summer term. For all further information, students are requested to regularly read their emails.

### Advanced Methods of Information Fusion

24344, SS 2020, 2 SWS, Language: German/English, [Open in study portal]

**Seminar (S)**
Content
The growing spread and performance of modern information and communication technologies produces an ever-increasing amount of data. It is one of the central challenges of our time to extract meaningful information from these data sets. The approach to address these issues, often called data science, combines strategies and methods from the fields of machine learning, mathematics, state estimation, visualization and pattern recognition. During this seminar, the students will familiarize themselves with concepts and methods particularly focusing on estimation theory and its application.

The seminar targets master students in computer science and bachelor students in Information engineering and management.

Seminar: Neuronale Netze und künstliche Intelligenz
2400078, WS 20/21, SWS, Language: German/English, Open in study portal

Content
In many tasks that appear natural to us, the fastest computers are unable to match the performance of the human brain. Neural networks attempt to simulate the parallel and distributed architecture of the brain in order to master these skills with learning algorithms. In this context, focus is being put on neural network approaches to computer vision and speech recognition, robotics and other areas.

In this seminar students will acquaint themselves with literature from provided topics and will present their results as a talk supported by slides to the other participants of the seminar.

Recommendations:
- Finishing the module “Kognitive Systeme” prior to the seminar is recommended.
- Attending the lecture “Deep Learning und Neuronale Netze” prior to the seminar is of advantage.
6.121 Course: Seminar: Legal Studies I [T-INFO-101997]

Responsible: Prof. Dr. Thomas Dreier
Organisation: KIT Department of Informatics
Part of: M-INFO-101218 - Seminar Module Law

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<td>2400061</td>
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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

Content
Registration via [https://portal.wiwi.kit.edu/ys/2708](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
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!
6.122 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

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**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)**

**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
## 6.123 Course: Software Engineering I [T-INFO-101968]

**Responsible:** Prof. Dr.-Ing. Anne Koziolek  
Prof. Dr. Ralf Reussner  
Prof. Dr. Walter Tichy

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-101175 - Software Engineering I

### Type
- Written examination

### Credits
- 6

### Recurrence
- Each summer term

### Version
- 1

### Events

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<th>4 SWS</th>
<th>Lecture / Practice (VÜ)</th>
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### 6.124 Course: Software Engineering I Pass [T-INFO-101995]

**Responsible:** Prof. Dr. Walter Tichy  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101175 - Software Engineering I

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6.125 Course: Software Engineering II [T-INFO-101370]

**Responsible:** Prof. Dr.-Ing. Anne Koziolek
Prof. Dr. Ralf Reussner
Prof. Dr. Walter Tichy

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-100833 - Software Engineering II

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

**Software Engineering II**

24076, WS 20/21, 4 SWS, Language: German, [Open in study portal](#)

**Literature**

6 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: Examination of another type
Credits: 4.5
Recurrence: Each term
Version: 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 Management and Engineering" so far. With this course students majoring in "Industrial Engineering and Management" and "Economics Engineering" also have the chance of getting practical experience and enhance their scientific capabilities.

The Special Topics Information Systems can be chosen instead of a regular lecture (see module description). Please take into account, that this course can only be accounted once per module.
6.127 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

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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:

Statistical Modeling of Generalized Regression Models

2521350, WS 20/21, 2 SWS, Open in study portal

Lecture (V)

Content

Learning objectives:
The student has profound knowledge of generalized regression models.

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

Workload:
Total workload for 4.5 CP: approx. 135 hours
Attendance: 30 hours
Preparation and follow-up: 65 hours
6.128 Course: Statistics I [T-WIWI-102737]

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

Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101432 - Introduction to Statistics

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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:

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
Literatur
Skriptum: Kurzfassung Statistik I

Weiterführende Literatur:

6 COURSES

Course: Statistics II [T-WIWI-102738]

6.129 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

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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)

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 [2610020].

Workload:
Total workload: 150 hours (5.0 Credits).
Attendance: 30 hours
Preparation and follow-up: 90 hours
Literature
Skriptum: Kurzfassung Statistik II

Weiterführende Literatur:
6.130 Course: Strategic Finance and Technology 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**  
Written examination  
**Credits**  
1.5  
**Recurrence**  
Each summer term  
**Version**  
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.
6.131 Course: Supplement Applied Informatics [T-WIWI-110711]

Responsible: Professorenschaft des Fachbereichs Informatik
Organisation: KIT Department of Economics and Management
Part of: M-WIWI-101476 - Business Processes and Information Systems

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**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.
6.132 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-103337 - Optimization under Uncertainty

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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
Prerequisite for admission to examination is the successful 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
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
6.133 Course: Telematics [T-INFO-101338]

**Responsible:** Prof. Dr. Martina Zitterbart  
**Organisation:** KIT Department of Informatics  
**Part of:** M-INFO-101194 - Telematics

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**Credits:** 6  
**Recurrence:** Each winter term  
**Version:** 1

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

**Telematics**  
24128, WS 20/21, 3 SWS, Language: German. [Open in study portal]

**Lecture (V)**

**Content**

The lecture covers (i.a.) protocols, architectures, as well as methods and algorithms, for routing and establishing reliable end-to-end connections in the Internet. In addition to various methods for media access control in local area networks, the lecture also covers other communication systems, e.g. circuit-switched systems such as ISDN. Participants should also have understood the possibilities for managing and administering networks.

Familiar with the contents of the lecture *Einführung in Rechnernetze* or comparable lectures is assumed.

**Learning Objectives**

After attending this lecture, the students will

- have a profound understanding of protocols, architectures, as well as procedures and algorithms used for routing and for establishing reliable end-to-end connections in the Internet
- have a profound understanding of different media access control procedures in local networks and other communication systems like circuit-switched ISDN
- have a profound understanding of the problems that arise in large scale dynamic communication systems and are familiar with mechanism to deal with these problems
- be familiar with current developments such as SDN and data center networking
- be familiar with different aspects and possibilities for network management and administration

Students have a profound understanding of the basic protocol mechanisms that are necessary to establish reliable end-to-end communication. Students have detailed knowledge about the congestion and flow control mechanisms used in TCP and can discuss fairness issue in the context of multiple parallel transport streams. Students can analytically determine the performance of transport protocols and know techniques for dealing with specific constraints in the context of TCP, e.g., high data rates and low latencies. Students are familiar with current topics such as the problem of middle boxes on the Internet, the usage of TCP in data centers or multipath TCP. Students are also familiar with practical aspects of modern transport protocols and know practical ways to overcome heterogeneity in the development of distributed applications.

Students know the functions of (Internet) routing and routers and can explain and apply common routing algorithms. Students are familiar with routing architectures and different alternatives for buffer placement as well as their advantages and disadvantages. Students understand the classification into interior and exterior gateway protocols and have in-depth knowledge of the functionality and features of common protocols such as RIP, OSPF, and BGP. Students are also familiar with current topics such as label switching, IPv6 and SDN.

Students know the function of media access control and are able to classify and analytically evaluate different media access control mechanisms. Students have an in-depth knowledge of Ethernet and various Ethernet variants and characteristics, which especially includes current developments such as real-time Ethernet and data center Ethernet. Students can explain and apply the Spanning Tree Protocol.

Students know the architecture of ISDN and can reproduce the peculiarities of setting up the ISDN subscriber line. Students are familiar with the technical features of DSL.

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Literature
6.134 Course: Theoretical Foundations of Computer Science [T-INFO-103235]

**Responsible:** Prof. Dr. Jörn Müller-Quade
Prof. Dr. Peter Sanders
Prof. Dr. Dorothea Wagner

**Organisation:** KIT Department of Informatics

**Part of:** M-INFO-101189 - Theoretical Informatics

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Module Handbook as of 14/09/2020
# 6.135 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

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**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.