Module Handbook
Information Engineering and Management (B.Sc.) ER 2005

Winter term 2009/2010
Long version
24.08.2009
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   - 5.1 Informatics  
     - IW1ININF1- Informatics 1  
     - IW1ININF2- Informatics 2  
     - IW1ININF3- Informatics 3  
     - IW1WWAINF- Applied Informatics  
     - IW1INTINF- Computer Engineering  
   - 5.2 Business Administration  
     - IW1WWBWL- Business Administration  
   - 5.3 Economics  
     - IW1WWVWL- Economics  
   - 5.4 Operations Research  
     - IW1WWOR- Introduction to Operations Research  
   - 5.5 Statistics  
     - IW1WWSTAT- Statistics  
   - 5.6 Law  
     - IW1INJURA- Business and Public Law  
   - 5.7 Mathematics  
     - IW1MAMATH- Mathematics  
   - 5.8 General Modules  
     - IW1EXPRAK- Internship  

6. Modules of term 5-6  
   - 6.1 Informatics  
     - IW3INALG0- Algorithm Design  
     - IW3INCS0- Design and Implementation of Complex Systems  
     - IW3INGP0- Business Process Engineering  
     - IW3INIDL0- Information Services in Networks  
     - IW3INISW0- Information and Knowledge Systems  
   - 6.2 BA/OR/EC  
     - IW3WWCRM0- Customer Relationship Management (CRM)  
     - IW3WWCRM1- Analytical CRM  
     - IW3WWCRM2- Operative CRM  
     - IW3WWDEC0- Decision Theory  
     - IW3WWEBM0- eBusiness Management  
     - IW3WWEBM1- Supply Chain Management  
     - IW3WWEBM2- eFinance: Information Engineering and Management in Finance  
     - IW3WWFIN0- Applied Finance  
     - IW3WWFIN1- Financial Economics  
     - IW3WWFIN2- Quantitative Finance  
     - IW3WWFIN3- Financial Markets  
     - IW3WWMAR1- Foundations of Marketing  
     - IW3WWORG0- Strategy and Managerial Economics  
     - IW3WWORG1- Strategy and Interaction  
     - IW3WWORG2- Modeling Strategic Decision Making and Economic Incentives  
     - IW3WWPRO0- Industrial Production  
   - 6.3 Law  

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Modulhandbuch: Stand 24.08.2009  
Information Engineering and Management (B.Sc.) ER 2005
### 6.4 General Modules

- 24004- Programming
- 24500- Algorithms I
- theogrundinfo- Theoretische Grundlagen der Informatik
- 24502- Rechnerorganisation
- 24512- Computer Engineering II
- 25070- Applied Informatics I - Modelling
- 25033- Applied Informatics II - IT Systems for e-Commerce
- 25002/25003- Financial Accounting and Cost Accounting
- 26490- Introduction to Information Engineering and Management
- 25024/25025- Business Administration and Management Science B
- 25026/25027- Business Administration and Management Science C
- 25040- Introduction to Operations Research I
- 25043- Introduction to Operations Research II
- 25512- Economics I: Microeconomics
- 25008/25009- Statistics I
- 25020/25021- Statistics II
- 24012- Civil Law for Beginners
- 24504- Advanced Civil Law
- 24011- Commercial and Corporate Law
- 24506/24017- Exercises in Civil Law
- 24016- Public Law I - Basic Principles
- 24520- Public Law II - Public Economic Law
- 01360- Mathematics I for Information Engineering and Management
- 01877- Mathematics II for Information Engineering and Management

### 7.2 Courses of term 5-6

- 21078- Logistics
- 24018- Data Protection Law
- 24070- Industrial Property and Copyright Law
- 24072- Public Key Cryptography
- 24074- Vernetzte IT-Infrastrukturen
- 24079- Algorithm Design
- 24079p- Practical Course in Algorithm Design
- 24079s- Seminar in Algorithm Design
- 24111- Workflowmanagement-Systems
- 24118- Data Warehousing and Mining
- 24124- Web Engineering
- 24149- Network and IT-Security Management
- 24171- Randomized Algorithms
- 24350- Europäische Entwicklungen im Informationsrecht
- 24518- Software Engineering I
- 24574- Communication and Database Systems
- 24603- The Digital Library
- 24626- Component Based Software Engineering
- 25016- Economics III: Introduction in Econometrics
- 25150- Marketing and Consumer Behavior
- 25154- Modern Market Research
- 25156- Marketing and Operations Research
- 25158- Corporate Planning and Operations Research
- 25177- Brand Management
- 25240- Market Microstructure
- 25325- Statistics and Econometrics in Business and Economics
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<td>25380</td>
<td>Bachelor Seminar in Enterprise Information Systems</td>
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1 Structure of the Bachelor Programme in Information Engineering and Management

The Bachelor programme in Information Engineering and Management 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 1 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.

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 statistics), and law. The internship prepares the student for his profession. Table 1 shows the structure of the subjects of the modules and their weight, table 2 shows the allocation of courses to modules and the curriculum for the first four terms.

### Table 1: Modules in the terms 1-4

<table>
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<tr>
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<td>Informatics 3</td>
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<td><strong>Subjects Business Administration, OR, Economics, and Statistics</strong></td>
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<td>IW1WWBWL</td>
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<td>Uhrig-Homburg, Weinhardt</td>
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<td>Waldmann, Stein</td>
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Abbildung 1: Structure of Bachelor Programme in Information Engineering and Management
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**Tabelle 2: Curriculum in the terms 1-4**
In the 3rd year (5th and 6th term) of the Bachelor programme the student must pass
1. a module with 21 credits in informatics
2. a module with 20 credits or two modules with 10 credits each in the subject BA/OR/EC,
3. a module with 10 credits in law,
4. and the bachelor thesis with 12 credits.

The following list of modules gives an overview of the modules a student may choose. They define the currently offered curriculum in the 3rd year.

### Modules in Informatics

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<td>IW3INISW0</td>
<td>Information and Knowledge Systems</td>
<td>Böhm</td>
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<tr>
<td>IW3INCS0</td>
<td>Design and Implementation of Complex Software Systems</td>
<td>Tichy</td>
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<td>IW3INNET0</td>
<td>Infrastructures</td>
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### Modules BA/OR/EC

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<td>Geyer-Schulz</td>
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<td>Decision Theory</td>
<td>Waldmann</td>
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<tr>
<td>IW3WWEBM0</td>
<td>eBusiness Management</td>
<td>Weinhardt</td>
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<td>IW3WWEBM1</td>
<td>Supply Chain Management: Information Management in Supply Networks</td>
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### Module Law

<table>
<thead>
<tr>
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<th>Module</th>
<th>Coordinator</th>
<th>CP</th>
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<tbody>
<tr>
<td>IW3INJURA</td>
<td>Law</td>
<td>Dreier, Kühling</td>
<td>10</td>
</tr>
</tbody>
</table>
2 Module Handbook - a helpful guide throughout the studies

The programme exists of several subjects (e.g. business administration, economics, operations research). Every subject is split into modules and every module itself exists of one or more interrelated courses. 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 programme, 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 programme according to personal needs, interest and job perspective. The module handbook describes the modules belonging to the programme. It describes:

- 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 catalogue, which provides important information concerning each semester and variable course details (e.g. time and location of the course).

Begin and completion of a module

Every module and every course is allowed to be credited only once. The decision whether the course is assigned to one module or the other (e.g. if a course is selectable in two or more modules) is made by the student at the time of signing in for the corresponding exam. The module is succeeded, if the general exam of the module and/or if all of its relevant partial exams have been passed (grade min 4.0). In order to that the minimum requirement of credits of this module have been met.

General exams and partial exams

The module exam can be taken in a general exam or several partial exams. If the module exam is offered as a general exam, the entire content of the module will be reviewed in a single exam. If the module exam exists of partial exams, the content of each course will be reviewed in corresponding partial exams. The registration for the examinations takes place online via the self-service function for students. The following functions can be accessed on https://studium.kit.edu/meinsemester/Seiten/pruefungsanmeldung.aspx:

- Sign in and sign off exams
- Retrieve examination results
- Print transcript of records

For further and more detailed information also see https://zvwgate.zvw.uni-karlsruhe.de/download/leitfaden_studierende.pdf

Repeating exams

Principally, a failed exam 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. Requests for a second repetition of an exam require the approval of the examination committee. A request for a second repetition has to be made without delay after loosing the examination claim. A counseling interview is mandatory. For further information see http://www.wiwi.uni-karlsruhe.de/studium/hinweise/.

Bonus accomplishments and additional accomplishments

Bonus accomplishments can be achieved on the basis of entire modules or within modules, if there are alternatives at choice. Bonus accomplishments can improve the module grade and overall grade by taking into account only the best possible combination of all courses when calculating the grades. The student has to declare a Bonus accomplishment as such at the time of registration for the exams. Exams, which have been registered as Bonus accomplishments, are subject to examination regulations. Therefore, a failed exam has to be repeated. Failing the repeat examination implies the loss of the examination claim.

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. Up to 2 modules with a minimum of 9 CP may appear additionally in the certificate. After the approval of the examination committee, it is also possible to include modules in the certificate, which are not defined in the module handbook. Single additional courses will be recorded in the transcript of records. Courses and modules, which have been declared as bonus accomplishments, can be changed to additional accomplishments.

Further information

More detailed information about the legal and general conditions of the programme can be found in the examination regulation of the programme (in the appendix).

<table>
<thead>
<tr>
<th>Used abbreviations</th>
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<tbody>
<tr>
<td><strong>LP/CP</strong></td>
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<td><strong>LV</strong></td>
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<td><strong>V</strong></td>
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<tr>
<td><strong>W</strong></td>
</tr>
</tbody>
</table>
3 Actual Changes

Important changes are pointed out in this section in order to provide a better orientation. Although this process was done with great care, other/minor changes may exist.

Infrastruktur [IW3INNET0] (S. 163)
22.09.2009: In the first version of this module handbook, the module was missing erroneously. It can be found in the appendix.

Computer Engineering [IW1INTINF] (S. 18)

Anmerkungen

Starting in the summer term 2009, it is possible to choose the lecture Rechnerorganisation [24502] in this module. Students, who have already started the lecture Technische Informatik [24512] can not subscribe in Rechnerorganisation.

Exceptionally for the summer term 2009, both lectures are the same, with different titles. Starting from the summer term 2010, only Rechnerorganisation will be continued.

eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38)

Anmerkungen

The lecture Derivatives will be first offered in this module in the summer term 2010.

Applied Finance [IW3WWFIN0] (S. 39)

Bedingungen

Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.

Seminars of all examiners of this module will be accepted.

Algorithm Engineering [xAlgoEng] (S. 159)

Anmerkungen

The lecture will be offered again in the winter term 09/10.
4 Modules

5 Modules of term 1-4

5.1 Informatics

Module: Informatics 1

Module key: [IW1ININF1]

Subject: Informatics
Module coordination: Gregor Snelting
Credit points (CP): 8

Learning Control / Examinations
Completion of Grundbegriffe der Informatik [24001], Programming [24004]: Both courses have to be completed successfully. Assessment is described in the courses of this module. The overall grade is determined by weighting the grades from each course according to the number of credits.

Attention: This module is part of the so-called “orientation” examination according to §10(1) of the examination regulation of the Bachelor programme in Information Engineering and Management. The examination for this module (including repetitions if necessary) must be passed until the end of the examination period of the third term in order not to be forced to drop out of the degree programme.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
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<tr>
<td>24004</td>
<td>Programming (S. 52)</td>
<td>2/0/2</td>
<td>W</td>
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</table>
Module: Informatics 2

Subject: Informatics
Module coordination: Peter Sanders
Credit points (CP): 8

Learning Control / Examinations
The assessment of the module consists of
1. a 90 minute lecture accompanying written intermediate exam according to SPO § 4 Abs. 2 Nr. 1;
2. a 120 minute written final exam according to SPO § 4 Abs. 2 Nr. 1;
3. a passed, not regularly graded certificate for the exercise according to SPO § 4 Abs. 2 Nr. 3.

The grade of the module is calculated as follows: 90% of the final exam and 10% of the intermediate exam.

Prerequisites
It is recommended to take this module after the module Informatics 1.

Conditions
Knowledge of the module Informatics 1 is required in this module.

Learning Outcomes
Basic principles of computer science are an important part of Information engineering. Therefore, students need fundamental understanding of algorithms and their design and analysis. The goal is to establish an understanding for approaches to problem solutions using computer science methods. In the context of the module Informatics 2, a system-oriented view plays an important role. Therefore, basics on processes, distributed systems and data bases are introduced.

Content
Abstract data types (ADT) form the basis for understanding algorithms. In this module, the Sigma algebra, the abstract data types Bool, Stack, Queue, and List are presented as examples of this concept. For the evaluation of algorithms several calculi are introduced. One example is the O-calculus which is used for the analysis of the asymptotic behavior of algorithms e.g. with respect to run time or memory usage (space).

In this module several classes of algorithms are presented with examples:
- Greedy algorithms form a special class of algorithms in informatics. They are characterized by always choosing the state which promises the highest profit at selection time as the next state – they are gradient methods (steepest ascent methods, hillclimbers). And from this behavior they derive their name: greedy algorithms. To decide which neighbouring state to choose as next state, evaluation functions are used. Greedy algorithms usually are very fast, they find for many problems good, but not always the best solution. In this module the following problems which can be solved with greedy algorithms are treated: Construction of a minimal spanning tree in a graph, finding the shortest path in graph, task scheduling, colouring graphs, and last but not least, the travelling salesman problem.

An other class of algorithms is represented by divide-and-conquer algorithms. Divide-and-conquer algorithms recursively split a problem in several subproblems until the subproblems can be handled. Next, partial solutions are recursively assembled to form the solution of the whole problem. In this module problems which can be solved by divide-and-conquer algorithms (e.g. finding a limit, matrix multiplication) are presented.

Problems in informatics may also be solved by algorithms which use dynamic programming. Dynamic programming is an algorithmic method for solving optimization problems. The method of dynamic programming is to directly compute the solution of the smallest subproblems first, and to assemble these solutions in a suitable way to solve the next larger subproblem, and so on. In this setting costly recursions should be omitted by reusing already computed intermediary solutions during the solution process. Already computed partial solutions are stored in a table, so that they can be reused. Dynamic programming is explained in this module with several examples e.g. the search for optimal binary search trees, the travelling salesmen problem, and catenated matrix multiplication.

Probabilistic algorithms are yet an other class of algorithms. A probabilistic algorithm uses – in contrast to the deterministic algorithms treated previously – random bits to control its execution. It is not required that a probabilistic algorithm always finds a correct solution in an efficient way. Probabilistic algorithms are often easier to understand, simpler to implement, and more efficient than deterministic algorithms for the same problem. Several classes of probabilistic algorithms exist. In this module Macao algorithms, Monte Carlo algorithm, and Las Vegas algorithms are presented.

The last class of algorithms in this module consists of algorithms which use predetermination or precomputation. Examples for these are the repeated evaluation of polynomials, as well as string search problems.

In this module processes are presented. A process is the carrier of the trajectory of an activity which is executed in its own address space in memory (physical encapsulation). The execution of an application program, for instance, runs as a process. A process usually can only access data in his own address space. This module addresses the problem of process change and presents several solutions for process management. The following deterministic and probabilistic algorithms for process management are presented as examples: first-come-first-serve, shortest-job-first, round-robin, and earliest-deadline-first.

In addition, the problem of communication between processes is treated. In this context semaphores, mutexes, message systems, and signals are introduced in this module. Communication between several processes can lead to deadlocks. A set of processes is in a deadlock, if each process of the set waits for an event which can only be triggered by process of the same set. In this module Banker’s algorithm which prevents deadlocks is treated.
Finally, distributed systems are presented in this module. In this context layered communication architectures are introduced and the concepts of horizontal and vertical communication are explained. Several types of communication are treated, especially connection-less (packet switching) and connection-oriented communication. As example for a communication protocol the alternating bit protocol is investigated.

### Courses in module Informatics 2 [IW1ININF2]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
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<td>Sanders</td>
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</table>
Module: Informatics 3

Subject: Informatics
Module coordination: Jörn Müller-Quade
Credit points (CP): 8

Learning Control / Examinations
- The assessment of the module consists of a grade certificate for the exercise according to § 4 Abs. 2 Nr. 3 SPO.
- Additionally, a written examination according to § 4 Abs. 2 Nr. 1 SPO.
The grade of the module corresponds to the grade of the written examination.

Prerequisites
It is recommended to take this module after the modules Informatics 1 and Informatics 2 have been passed.

Conditions
None.

Learning Outcomes
Students should learn to understand the potential and limits of computer science: there are important problems, whose solutions can be well defined, however, one will be never able to compute them systematically. Other problems can be solved “presumably” only by systematic trial and error. Other topics of this lecture provide a basis for circuit design, compiler design, pattern matching, etc.. Most of the lecture results will be rigorously proven. The proof techniques, learned thereby, are important for the specification of computer systems and for the systematic design of programs and algorithms.

Content
Fundamental 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, register machines, RAM-model, non-determinism, relation to formal language families. Equivalence of all sufficiently powerful computation models (Church’s thesis). Undecidability of important functions (halting problem, ...). Introduction to the complexity theory: NP-complete problems and polynomial reductions.

Courses in module Informatics 3 [IW1ININF3]

<table>
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<th>ID</th>
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<td>theogrundinfo</td>
<td>Theoretische Grundlagen der Informatik (S. 54)</td>
<td>3/1</td>
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<td>Müller-Quade</td>
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</table>

Remarks
This module will be offered from the winter term 09/10 on in a different form. The course Informatics III will be substituted by an adequate course.
Module: Applied Informatics

Subject: Informatics
Module coordination: Andreas Oberweis, Stefan Tai
Credit points (CP): 8

Learning Control / Examinations
The assessments of the Applied Informatics I [25070] and Applied Informatics II [25033] are written examinations (60 min each) according to §4(2), 1 SPO.
The grade of the module is the average of the grade of the assessment of the course 25070 and of the grade of 25033.

Prerequisites
Knowledge of modules Informatics 1 [IW1ININF1] and Informatics 2 [IW1ININF2] is expected.

Conditions
None.

Learning Outcomes
The student should:
- Become familiar with relevant modelling languages for describing application domains and aspects of early software system design.
- Gain insight into methods and systems in computer science that support electronic business, and learn to select, design, and apply these methods and systems in a way that is appropriate for the application context.

Content
The course Applied Informatics I [25070] 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 II [25033] covers various facets of electronic commerce which have to be supported by adequate and efficient information and communication systems. After a brief introduction into e-commerce the following topics are covered: application architectures (incl. client server architectures), document description and exchange (incl. XML), enterprise middleware (incl. CORBA, Java EE), enterprise SOA (incl. Web services).

Courses in module Applied Informatics [IW1WWAINF]

<table>
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<td>25033</td>
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</table>

Oberweis, Studer, Agarwal Tai
Module: Computer Engineering

Subject: Informatics
Module coordination: Wolfgang Karl
Credit points (CP): 6

Learning Control / Examinations
The assessment of the course Computer Engineering II is a written examination (60 minutes) according to § 4 Abs. 2 Nr. 1 SPO. The grade of the module is the grade of the written exam.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The goal of this module is to introduce the principles for the design and organization of computers. The emphasis is to show the relationship between hardware and software and to focus on the concepts that are the basics for current computers. The audience should understand how computing systems work and how programs run efficiently on modern computers.

Content
The module begins with a historical perspective of computer architectures and processors. It then shows the hardware/software interface and the requirements of high-level programming languages for the instruction set architecture. The organization and components of computers, their functionality and interoperability are then described. Finally, the impact of the hardware concepts on the software is discussed in order to demonstrate why a system performs as it does.

Courses in module Computer Engineering [IW1INTINF]

<table>
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<tr>
<th>ID</th>
<th>Course</th>
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<td>24502</td>
<td>Rechnerorganisation (S. 55)</td>
<td>3/1/2</td>
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<td>6</td>
<td>Asfour, Dillmann, Henkel, Karl</td>
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</table>

Remarks
Starting in the summer term 2009, it is possible to choose the lecture Rechnerorganisation [24502] in this module. Students, who have already started the lecture Technische Informatik [24512] can not subscribe in Rechnerorganisation.
Exceptionally for the summer term 2009, both lectures are the same, with different titles. Starting from the summer term 2010, only Rechnerorganisation will be continued.
5.2 Business Administration

Module: Business Administration

Subject: Business Administration
Module coordination: Marliese Uhrig-Homburg, Christof Weinhardt
Credit points (CP): 15

Learning Control / Examinations
The assessment of the course Financial Accounting and Cost Accounting is a written examination according to §4(2), 3 of the examination regulation of the Bachelor programme in Information Engineering and Management. The grade certificate for this course is a prerequisite for the last written examination of this module according to §4(2), 1 of the examination regulation of the Bachelor programme in Information Engineering and Management.

The assessment of the course Introduction to Information Engineering and Management is an assessment according to §4(2), 3 of the examination regulation of the Bachelor programme in Information Engineering and Management.

The assessments of the courses Business Administration and Management Science B and C are written examinations (90 minutes each) according to §4(2), 1 of the examination regulation of the Bachelor programme in Information Engineering and Management. The grade of the module is the average of the grades of the assessments of the courses Introduction to Information Engineering and Management Business Administration and Management Science C and B, weighted by their credit points.

Prerequisites
None.

Conditions
The grade certificate in Financial Accounting and Cost Accounting is a prerequisite for the last examination of the module.

Learning Outcomes
In this module students learn the core knowledge of Business Administration and Management Science. Based on financial accounting and management accounting the central activities, functions and decisions of a company in a market economy are presented and analyzed. Furthermore the basic role of information as a production factor is illustrated by showing the connections of different scientific disciplines in the information society. Examples about the importance of information in the context of companies that offer information based services, the information technology involved, and the implementation of electronic markets and their logistics should provide a better understanding of the role of information in the “Knowledge Economy”.

Students should understand the interdisciplinary links between the design of a company’s business processes, information technology, and the legal framework in which the company operates.

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. 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.

Courses in module Business Administration [IW1WWBWL]

<table>
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<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
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<th>Responsible Lecturer(s)</th>
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<td>25002/25003 26490</td>
<td>Financial Accounting and Cost Accounting (S. 59) Introduction to Information Engineering and Management (S. 60)</td>
<td>2/2 W 4</td>
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<td>Burdelski, Weinhardt, Geyer-Schulz</td>
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<tr>
<td>25026/25027</td>
<td>Business Administration and Management Science C (S. 63)</td>
<td>2/0/2 W 4</td>
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<td>Lindstädt, Ruckes, Uhrig-Homburg, Burdelski Gaul, Lützkendorf, Geyer-Schulz, Weinhardt, Burdelski</td>
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<td>Business Administration and Management Science B (S. 62)</td>
<td>2/0/2 S 4</td>
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</tbody>
</table>
5.3 Economics

Module: Economics

Subject: Economics

Module coordination: Siegfried Berninghaus, Clemens Puppe

Credit points (CP): 5

Learning Control / Examinations

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. Additionally, there can be a midterm written examen where students can improve their grades in the final examen.

Attention: This module is part of the Orientierungsprüfung according to §10 (1), SPO 2009 resp. §8 (1) SPO 2005. The examen needs to be passed until the end of the examination period of the second semester or in case of repetition until the end of the examination period of the third semester.

Prerequisites

None.

Conditions

None.

Learning Outcomes

It is the main aim of this module to provide basic knowledge in economic modelling. Particularly, 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 but 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 possibly 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 possibly to present own problem solutions,
• solve simple economic decision problems.

Content

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.

Courses in module Economics [IW1WWVWL]

<table>
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<tr>
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</tbody>
</table>

Remarks

When personal resources are available students’ tutorials will be established.
5.4 Operations Research

Module: Introduction to Operations Research  
Module key: [IW1WWOR]

**Subject:** Operations Research  
**Module coordination:** Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann  
**Credit points (CP):** 9

**Learning Control / Examinations**
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**
Mathematics I und II. Programming knowledge for computing exercises.

**Conditions**
It is strongly recommended to attend the course *Introduction to Operations Research I* [25040] before attending the course *Introduction to Operations Research II* [25043].

**Learning Outcomes**
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.

**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.

**Courses in module Introduction to Operations Research [IW1WWOR]**

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25040</td>
<td>Introduction to Operations Research I (S. 64)</td>
<td>2/2/2</td>
<td>S</td>
<td>4.5</td>
<td>Nickel, Stein, Waldmann</td>
</tr>
<tr>
<td>25043</td>
<td>Introduction to Operations Research II (S. 65)</td>
<td>2/2/2</td>
<td>W</td>
<td>4.5</td>
<td>Nickel, Stein, Waldmann</td>
</tr>
</tbody>
</table>
5.5 Statistics

Module: Statistics

Module key: [IW1WWSTAT]

Subject: Statistics
Module coordination: Svetlozar Rachev, Markus Höchstötter
Credit points (CP): 10

Learning Control / Examinations
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.

Prerequisites
None.

Conditions
It is recommended to attend the course Statistics I [25008/25009] before the course Statistics II [25020/25021].
Each course is complemented by an exercise, a tutorium and a computing laboratory. It highly recommended to attend these too.

Learning Outcomes

Content
The module contains the fundamental methods and scopes of Statistics.
A. Descriptive Statistics: univariate and 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, convolution and limit distributions
C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method), internal estimations, theory of tests (optimality, most important examples of tests)

Courses in module Statistics [IW1WWSTAT]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tr>
<td>25008/25009</td>
<td>Statistics I (S. 67)</td>
<td>4/0/2</td>
<td>S</td>
<td>5</td>
<td>Höchstötter</td>
</tr>
<tr>
<td>25020/25021</td>
<td>Statistics II (S. 68)</td>
<td>4/0/2</td>
<td>W</td>
<td>5</td>
<td>Höchstötter</td>
</tr>
</tbody>
</table>
5.6 Law

Module: Business and Public Law

Module key: [IW1INJURA]

Subject: Law

Module coordination: Thomas Dreier

Credit points (CP): 19

Learning Control / Examinations

The assessment of this module consists of:

1. a written examination (90 min) according to § 4(2), 1 of the SPO for the course Civil Law for Beginners (4 ECTS),
2. a graded certificate according to § 4(2), 3 of the SPO for the courses Civil Law for Beginners, Advanced Civil Law, and Commercial and Corporation Law (9 ECTS), and
3. a written examination (90 min) according to § 4(2), 1 of the SPO for the courses Public Law I and II (6 ECTS).

The grade of the module is a credits weighted average of the grades, namely the grade for Civil Law for Beginners with a weight of 4 credits, the grade for Solving Private Law Cases with a weight of 9 credits, and the grade for Public Law I and II with a weight of 6 credits.

Prerequisites

None.

Conditions

None.

Learning Outcomes

The modul Law of the first two years of Bachelor studies shall provide the students with an introduction into law and teach them fundamental knowledge about civil law, commercial and corporation law as well as public law. Students shall be enabled to recognise legal issues, formulate legal questions, and solve simple legal problems. Also, they shall be able to recognise when outside legal counsel is called for in a given situation. They shall be able to communicate with lawyers. Besides solid knowledge of material law, students also shall be able to solve practical cases with the method of so-called subsumtion.

Content

The modul Law of the first two years of Bachelor studies provides the students with an introduction and an overview of both the role and the working of the law as an instrument of preventing and solving conflicts within society as well as allocation risks. To this end, the modul comprises courses in the areas of civil law, commercial and corporation law as well as of public law (with the exception of criminal law). The courses in civil law cover the general part of the German Civil Code (Bürgerliches Gesetzbuch, BGB), contract and property law. The commercial and corporation law courses explain the notions of merchant, the different forms of agency and commercial transactions as well as the main statutory forms of corporations. The public law courses cover fundamental rights, state organisation, administrative law and administrative as well as constitutional legal remedies.

Courses in module Business and Public Law [IW1INJURA]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tr>
<td>24012</td>
<td>Civil Law for Beginners (S. 69)</td>
<td>4/0</td>
<td>W</td>
<td>4</td>
<td>Dreier, Sester</td>
</tr>
<tr>
<td>24504</td>
<td>Advanced Civil Law (S. 70)</td>
<td>2/0</td>
<td>S</td>
<td>3</td>
<td>Dreier, Sester</td>
</tr>
<tr>
<td>24011</td>
<td>Commercial and Corporate Law (S. 71)</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Sester</td>
</tr>
<tr>
<td>24016</td>
<td>Public Law I - Basic Principles (S. 73)</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Spiecker genannt Döhmann</td>
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<tr>
<td>24520</td>
<td>Public Law II - Public Economic Law (S. 74)</td>
<td>2/0</td>
<td>S</td>
<td>3</td>
<td>Spiecker genannt Döhmann</td>
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<tr>
<td>24506/24017</td>
<td>Exercises in Civil Law (S. 72)</td>
<td>2/0</td>
<td>W/S</td>
<td>3</td>
<td>Sester, Dreier</td>
</tr>
</tbody>
</table>
5.7 Mathematics

Module: Mathematics

Subject: Mathematics
Module coordination: Christian Wieners
Credit points (CP): 15

Learning Control / Examinations
The assessment in this module consists of two graded certificates of exercise following §4(2), 3 of the examination regulation for the Bachelor Information Engineering and Management from the exercises to mathematics I or II and a written examination of 120 minutes on the lectures mathematics I and mathematics II following §4(2), 1 of the examination regulations Bachelor Information Engineering and Management. One certificate of exercise with a grade of at least sufficient is required for the admission to the written examination. 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 two certificates a weight of 10% each.

Prerequisites
None.

Conditions
None.

Learning Outcomes
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 should 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.

Courses in module Mathematics [IW1MAMATH]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
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<tbody>
<tr>
<td>01360</td>
<td>Mathematics I for Information Engineering and Management (S. 75)</td>
<td>4/2/2</td>
<td>W</td>
<td>7.5</td>
<td>Rieder, Wieners, Neuss</td>
</tr>
<tr>
<td>01877</td>
<td>Mathematics II for Information Engineering and Management (S. 76)</td>
<td>4/2/2</td>
<td>S</td>
<td>7.5</td>
<td>Rieder, Wieners, Neuss</td>
</tr>
</tbody>
</table>

Remarks
None.
5.8 General Modules

Module: Internship
Module key: [IW1EXPRAK]

Subject: nicht kategorisiert
Module coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften)
Credit points (CP): 8

Learning Control / Examinations
The assessment is in the form of a certificate of employment about at least 6 weeks, a written report and a short presentation.

Prerequisites
None.

Conditions
The internship is regulated in §15 of the examination regulation. Examiners are all lecturers of the degree programme. It is recommended that the internship is taken between the 4th and the 5th term of the Bachelor programme Information Engineering and Management.

Learning Outcomes

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 be 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”).

Remarks
The form for the internship is available at the examination offices of the two faculties participating in the programme.
6 Modules of term 5-6

6.1 Informatics

Module: Algorithm Design

Module key: [IW3INALG0]

Subject: Informatics (Specialization)

Module coordination: Dorothea Wagner

Credit points (CP): 21

Learning Control / Examinations

The assessment of each course is outlined in its course description. The grade of this module is the credit-weighted average of the grades of the selected courses.

Prerequisites

Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation, especially the modules Informatics 1 [IW_05_1ININF1] and Informatics 2 [IW_05_1_ININF2] have to be passed.

Conditions

This module consists of one course from each of the following four blocks and the total number of credits is at least 21:

1. At least one of the courses [24079] and [25700] has to be selected.
2. At least one of the following course [24518], [24574], [24074] and [24116] has to be selected.
3. A seminar has to be selected.
4. At least one of the following course [24171], [24624] and [24649] has to be selected.
5. The lecture Algorithmentechnik has to be passed for the lectures [24171] and [24624].

Learning Outcomes

The students should

- be able to identify and adequately specify the algorithmic problems in different application areas,
- be able to assess their computational complexity and recognize adequate algorithmic techniques for solving the problems,
- know the essential methodological approaches to the design and analysis of algorithms,
- be able to design algorithmic methods for specific applications,
- be able to express methodological aspects of algorithms in a qualified and structured form.

Content

This module addresses theoretical and practical aspects of algorithm engineering. It covers general methods for the design and analysis of algorithms related to sequential and parallel models of computation, as well as general algorithmic methods like approximation algorithms, online methods, randomized algorithms and specific methods of algorithm engineering.

Courses in module Algorithm Design [IW3INALG0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
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<tbody>
<tr>
<td>24079</td>
<td>Algorithm Design (S. 82)</td>
<td>3/1 W 6</td>
<td>25700</td>
<td></td>
<td>Wagner, Sanders, Schmeck</td>
</tr>
<tr>
<td>24574</td>
<td>Efficient Algorithms (S. 109)</td>
<td>2/1 S 5</td>
<td>24704</td>
<td></td>
<td>Böhm, Zitterbart</td>
</tr>
<tr>
<td>24074</td>
<td>Vernetzte IT-Infrastrukturen (S. 81)</td>
<td>4/2 S 4/8</td>
<td>2472</td>
<td></td>
<td>Juling</td>
</tr>
<tr>
<td>24072</td>
<td>Public Key Cryptography (S. 80)</td>
<td>2/1 W 5</td>
<td>24079s</td>
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<td>Geiselmann</td>
</tr>
<tr>
<td>24079s</td>
<td>Seminar in Algorithm Design (S. 84)</td>
<td>2 W/S 3</td>
<td>24079p</td>
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<td>Wagner</td>
</tr>
<tr>
<td>24171</td>
<td>Randomized Algorithms (S. 89)</td>
<td>4 W/S 5</td>
<td>24171</td>
<td></td>
<td>Sanders, Wagner, Krug</td>
</tr>
<tr>
<td>xAlgoEng</td>
<td>Algorithm Engineering (S. 159)</td>
<td>2 W 4</td>
<td>24518</td>
<td></td>
<td>Worsch</td>
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<tr>
<td>24518</td>
<td>Software Engineering I (S. 91)</td>
<td>3/1/2 S 6</td>
<td></td>
<td></td>
<td>Tichy, Höfer, Meder</td>
</tr>
</tbody>
</table>

Remarks

None.
Module: Design and Implementation of Complex Systems

Subject: Informatics (Specialization)
Module coordination: Walter F. Tichy
Credit points (CP): 21

Learning Control / Examinations
See the assessment of each course of this module. The overall grade is computed by weighting the grade of each course with its credits and computing the average of the weighted grades, rounded to one decimal place.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- The course Software Engineering I [24518] is mandatory.
- Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.

Learning Outcomes
Students must be capable of
- recognizing and explaining the need for a planned and structured process for the development of complex software systems,
- performing and supervising the major tasks of software development and maintenance,
- integrating databases and communication networks into their solutions,
- critically assessing methods and tools for system development
- recognizing the advantages of software components and applying the techniques of component software.

Content
Participating in the development of complex systems is one of the major tasks of the practicing Information Engineer. This module enables students to perform suitable tasks by themselves or as a member of a team, as well as planning large systems and supervising their development.

Courses in module Design and Implementation of Complex Systems [IW3INCS0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tbody>
<tr>
<td>24518</td>
<td>Software Engineering I (S. 91)</td>
<td>3/1/2</td>
<td>S</td>
<td>6</td>
<td>Tichy, Höfer, Meder</td>
</tr>
<tr>
<td>24574</td>
<td>Communication and Database Systems (S. 92)</td>
<td>4/2</td>
<td>S</td>
<td>4/8</td>
<td>Böhme, Zitterbart</td>
</tr>
<tr>
<td>24626</td>
<td>Component Based Software Engineering (S. 94)</td>
<td>2</td>
<td>S</td>
<td>3</td>
<td>Reussner, Kuperberg, Krogmann</td>
</tr>
<tr>
<td>SWTSem</td>
<td>Seminar in Software Engineering (S. 150)</td>
<td>2</td>
<td>W/S</td>
<td>3</td>
<td>Tichy, Reussner, Snelting</td>
</tr>
</tbody>
</table>
Module: Business Process Engineering

Module key: [IW3INGP0]

Subject: Informatics (Specialization)
Module coordination: Andreas Oberweis
Credit points (CP): 21

Learning Control / Examinations
Students elect courses with 21 ECTS credits in total. The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Exactly one seminar of this module has to be chosen and completed (§17, 3 of the examination regulation for Information Engineering and Management). A maximum of one practical course can be chosen.

Learning Outcomes
Students acquire in-depth knowledge of modeling languages, methodologies and software tools to support the entire life cycle of business processes. They know how to model, to analyse and to design independently business processes in enterprise taking into account given corporate goals. Moreover, they know the functionality, architecture and applications of workflow management systems, document management systems and groupware systems to support the process execution.

Content
This module teaches modelling of business processes and supporting tools.

Courses in module Business Process Engineering [IW3INGP0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tbody>
<tr>
<td>25726</td>
<td>Workflow-Management (S. 111)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Oberweis</td>
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<tr>
<td>25736</td>
<td>Business Process Modelling (S. 113)</td>
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<td>W</td>
<td>5</td>
<td>Oberweis, Mevius</td>
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<tr>
<td>25740</td>
<td>Knowledge Management (S. 114)</td>
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<td>W</td>
<td>5</td>
<td>Studer</td>
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<td>25748</td>
<td>Semantic Web Technologies I (S. 115)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Studer, Rudolph</td>
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<tr>
<td>25786</td>
<td>Enterprise Architecture Management (S. 119)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Wolf</td>
</tr>
<tr>
<td>25730</td>
<td>Software Technology: Quality Management (S. 112)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Oberweis</td>
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<tr>
<td>25790</td>
<td>Capability maturity models for software and systems engineering (S. 120)</td>
<td>2</td>
<td>S</td>
<td>4</td>
<td>Kneuper</td>
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<td>PraBI</td>
<td>Computing Lab Information Systems (S. 149)</td>
<td>2</td>
<td>W/S</td>
<td>5</td>
<td>Oberweis, Seese, Stucky, Studer</td>
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<td>BSemBI</td>
<td>Bachelor Seminar in Enterprise Information Systems (S. 148)</td>
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<td>W/S</td>
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<td>Oberweis</td>
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<tr>
<td>SemAIFB1</td>
<td>Seminar in Enterprise Information Systems (S. 151)</td>
<td>2</td>
<td>W/S</td>
<td>4</td>
<td>Studer, Oberweis, Stucky, Wolf, Kneuper</td>
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<tr>
<td>24518</td>
<td>Software Engineering I (S. 91)</td>
<td>3/1/2</td>
<td>S</td>
<td>6</td>
<td>Tichy, Höfer, Meder</td>
</tr>
</tbody>
</table>

Remarks
None.
Module: Information Services in Networks

Module key: [IW3INIDLO]

Subject: Informatics (Specialization)
Module coordination: Hartmut Schmeck
Credit points (CP): 21

Learning Control / Examinations
The assessment of the individual courses is defined in the course descriptions. The grade of the module is the credit-weighted sum of the grades of the courses and the seminar or advanced lab.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- Courses 24074 and 25702 are compulsory.
- Select one out of 24518 and 24116.
- Select one out of 25748, 24124, 25770, 24149.
- Following § 17, 3 of “Prüfungsordnung Informationswirtschaft” a seminar of this module has to be chosen and completed.
- Seminar and advanced lab may be offered by any of the lecturers participating in this module.

Learning Outcomes
The students shall
- know technologies and applications of the Internet and the World Wide Web,
- know methods for providing security in networks and be capable of customizing these methods for specific applications,
- know how to design and utilize Internet applications in an appropriate way.

Content
The design of services in the Internet and the World Wide Web is one of the core tasks of Information Engineering and Management. The courses of this module provide a foundation for adequately specifying applications and services in the Internet and for designing and employing them efficiently in accordance with the potential and constraints of web technologies.

Courses in module Information Services in Networks [IW3INIDLO]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
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<tbody>
<tr>
<td>24074</td>
<td>Vernetzte IT-Infrastrukturen (S. 81)</td>
<td>2/1 W 5</td>
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<td>Juling</td>
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<tr>
<td>25702</td>
<td>Algorithms for Internet Applications (S. 110)</td>
<td>2/1 W 5</td>
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<td>Schmeck</td>
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<tr>
<td>24072</td>
<td>Public Key Cryptography (S. 80)</td>
<td>2/1 W 5</td>
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<td>Geiselmann</td>
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<td>25748</td>
<td>Semantic Web Technologies I (S. 115)</td>
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<td>Studer, Rudolph</td>
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<tr>
<td>24124</td>
<td>Web Engineering (S. 87)</td>
<td>2/0 W 4</td>
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<tr>
<td>24149</td>
<td>Network and IT-Security Management (S. 88)</td>
<td>2/1 W 5</td>
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</tr>
<tr>
<td>25770</td>
<td>Service Oriented Computing I (S. 118)</td>
<td>2/1 W 5</td>
<td></td>
<td>Tai</td>
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<tr>
<td>xIDLs</td>
<td>Seminar Information Services in Networks (S. 161)</td>
<td>2 W/S 4</td>
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<td>Schmeck, Tai, Juling, Studer, Hartenstein, Tichy</td>
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<td>xIDLp</td>
<td>Practical Course Information Services in Networks (S. 160)</td>
<td>4 W/S 5</td>
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<td>Schmeck, Tai, Juling, Tichy, Studer, Hartenstein</td>
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<tr>
<td>24518</td>
<td>Software Engineering I (S. 91)</td>
<td>3/1/2 S 6</td>
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<td>Tichy, Höfer, Meder</td>
</tr>
</tbody>
</table>
Module: Information and Knowledge Systems

Subject: Informatics (Specialization)
Module coordination: Klemens Böhm
Credit points (CP): 21

Learning Control / Examinations
The assessment is described individually for each lecture within this module. The overall grade of the module will be the rounded average of the courses selected weighted by their respective credits.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- The lectures “Communications and Database Systems” and “Knowledge Management” are mandatory.
- Exactly one seminar must be chosen.

As a complementary module from economics we recommend Customer Relationship Management (CRM).

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

Content
This module aims at exposing students to modern information and knowledge management. It is not only the fundamental theory and concepts that are part of this module, but also the deployment of such technology.

Courses in module Information and Knowledge Systems [IW3INISW0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tr>
<td>24574</td>
<td>Communication and Database Systems (S. 92)</td>
<td>4/2</td>
<td>S</td>
<td>4/8</td>
<td>Böhm, Zitterbart</td>
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<tr>
<td>25740</td>
<td>Knowledge Management (S. 114)</td>
<td>2/1</td>
<td>W</td>
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<tr>
<td>24118</td>
<td>Data Warehousing and Mining (S. 86)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Böhm</td>
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<tr>
<td>24111</td>
<td>Workflowmanagement-Systems (S. 85)</td>
<td>2/1</td>
<td>W</td>
<td>3</td>
<td>Mülle</td>
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<td>24603</td>
<td>The Digital Library (S. 93)</td>
<td>2/1</td>
<td>S</td>
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<td>25762</td>
<td>Intelligent Systems in Finance (S. 116)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
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<td>prosemis</td>
<td>Undergraduate Seminar Information Systems (S. 157)</td>
<td>2/1</td>
<td>S</td>
<td>3</td>
<td>Böhm</td>
</tr>
<tr>
<td>SemAIFB4</td>
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<td>W</td>
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<td>Studer</td>
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</tbody>
</table>
6.2  BA/OR/EC

Module: Customer Relationship Management (CRM)  
Module key: [IW3WWCRM0]

Subject: BA/OR/EC (Specialization)
Module coordination: Andreas Geyer-Schulz
Credit points (CP): 20

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- Students must take the courses Customer Relationship Management [26508], Operatives CRM [26520], Analytical CRM [26522], and Bachelor-Seminar CRM [26524].
- The Bachelor-Seminar CRM [26524] has to be attended prior to or parallel to the course Customer Relationship Management [26508].
- Additionally, they may choose between Wettbewerb in Netzen [26240], and Unternehmensplanung und OR [25158].

We recommend to visit the modules Information and Knowledge Based Systems [IW3INISW0] or Business Processes [IW3INGP0].

Learning Outcomes
- The student understands service management as the basis of customer relationship management.
- The student sees the consequences of this strategic decision for the company as a whole as well as for all of its organizational parts.
- The student designs and implements standard CRM processes in a company environment.
- The student knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases.
- The student designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, ...).
- The student is aware of the problems of protecting the privacy of customers and the implications of privacy law.
- The student gains an overview of the market for CRM software.
- The student knows the current developments in CRM in science as well as in industry.

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

For operative CRM we present the design of customer-oriented, IT-supported business processes based on business process modelling and we explain these processes in concrete application scenarios (e.g. marketing campaign management, call center management, sales force management, field services, ...). Analytic CRM is dedicated to improve the use of knowledge about customers in the broadest sense for decision-making (e.g. product-mix decisions, bonus programs based on customer loyalty, ...) and for the improvement of services. A requirement for this is the tight integration of operative systems with a data warehouse, the development of customer-oriented and flexible reporting systems, and – last but not least – the application of statistical methods (clustering, regression, stochastic models, ...).

Courses in module Customer Relationship Management (CRM) [IW3WWCRM0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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<tbody>
<tr>
<td>26508</td>
<td>Customer Relationship Management (S. 140)</td>
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<td>W</td>
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<td>Geyer-Schulz</td>
</tr>
<tr>
<td>26522</td>
<td>Analytical CRM (S. 143)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Geyer-Schulz</td>
</tr>
<tr>
<td>26520</td>
<td>Operative CRM (S. 141)</td>
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<td>W</td>
<td>5</td>
<td>Geyer-Schulz</td>
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<tr>
<td>26524</td>
<td>Bachelor Seminar in Information Engineering and Management (S. 144)</td>
<td>2 W/S</td>
<td>2</td>
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<td>Geyer-Schulz</td>
</tr>
<tr>
<td>25158</td>
<td>Corporate Planning and Operations Research (S. 99)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Gaul</td>
</tr>
<tr>
<td>26240</td>
<td>Competition in Networks (S. 134)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Mitusch</td>
</tr>
</tbody>
</table>

Remarks
The course Customer Relationship Management [26508] will be held in English.
Module: Analytical CRM  
Module key: [IW3WWCRM1]

Subject: BA/OR/EC (Specialization)
Module coordination: Andreas Geyer-Schulz
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Students must take the courses Analytical CRM [26522], and Bachelor-Seminar CRM [26524]. Additionally, they may choose from the following courses: Customer Relationship Management [26508], Wettbewerb in Netzen [26240], and Unternehmensplanung und OR [25158]. The Bachelor-Seminar CRM [26524] has to be attended prior to or parallel to a CRM course.

We recommend to visit the modules Information and Knowledge Based Systems [IW3INISW0] or Business Processes [IW3INGP0] in informatics. The module Foundations of Marketing [IW3WWMAR1] is a suitable complement.

Learning Outcomes
- The student designs the ETL process (Extraction / Translation / Loading) as the interface process between analytic and operative CRM.
- The student models and implements data-warehouse systems with performance aspects properly considered.
- The student knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and their application to decision-making. He solves standard cases with these methods on his own.
- The student should gain an overview of the most important methods suitable for analytic CRM and he should be able to choose appropriate methods on his own.
- The student performs a standard CRM analysis of a decision problem based on real company data. His report gives recommendations together with the reasons for them.
- The student has an overview of the current market for analytic CRM software.

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

Courses in module Analytical CRM [IW3WWCRM1]

<table>
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<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
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<td>Geyer-Schulz</td>
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<tr>
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<td>W</td>
<td>5</td>
<td>Gaul</td>
</tr>
<tr>
<td>26240</td>
<td>Competition in Networks (S. 134)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Mitusch</td>
</tr>
<tr>
<td>26524</td>
<td>Bachelor Seminar in Information Engineering and Management (S. 144)</td>
<td>2</td>
<td>W/S</td>
<td>2</td>
<td>Geyer-Schulz</td>
</tr>
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</table>

Remarks
The course Customer Relationship Management [26508] will be held in English.
Module: Operative CRM

Subject: BA/OR/EC (Specialization)
Module coordination: Andreas Geyer-Schulz
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Students must take the courses Operatives CRM [26520], and Bachelor-Seminar CRM [26524]. Additionally, they may choose from the following courses: Customer Relationship Management [26508], Wettbewerb in Netzen [26240], and Unternehmensplanung und OR [25158].

We recommend to visit the modules Information and Knowledge Based Systems [IW3INISW0] or Business Processes [IW3INGP0] in informatics. The module Foundations of Marketing [IW3WWMAR1] is a suitable complement.

Learning Outcomes
- The student understands methods of modelling business processes and he is able to apply them to operative CRM processes.
- The student designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, ...).
- The student has an overview of the current market for operative CRM software and about current trends in operative CRM processes.
- The student is aware of the problems of protecting the privacy of customers and the implications of privacy law.
- The student is able to design and implement a standard process from operative CRM in a company environment.

Content
The module Operative CRM emphasizes the design of operative CRM processes. This includes the modelling, implementation, introduction and change, as well as the analysis and evaluation of operative CRM processes. Petri nets and their extensions are the scientific foundation of process modelling. The link of Petri nets to process models used in industry as e.g. UML activity diagrams is presented. In addition, a framework for process innovation which aims at a radical improvement of key business processes is introduced. The following application areas of operative CRM processes are presented and discussed:
- Strategic marketing processes
- Operative marketing processes (campaign management, permission marketing, ...)
- Customer service processes (sales force management, field services, call center management, ...)

Courses in module Operative CRM [IW3WWCRM2]

<table>
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<tr>
<th>ID</th>
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<th>Hours per week</th>
<th>Term</th>
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<td>Operative CRM (S. 141)</td>
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<td>W</td>
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<td>Geyer-Schulz</td>
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<tr>
<td>25158</td>
<td>Corporate Planning and Operations Research (S. 99)</td>
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<td>W</td>
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<td>Gaul</td>
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<td>26240</td>
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<td>W</td>
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Remarks
The course Customer Relationship Management [26508] will be held in English.
Module: Decision Theory

Module key: [IW3WWDEC0]

Subject: BA/OR/EC (Specialization)

Module coordination: Siegfried Berninghaus

Credit points (CP): 10

Learning Control / Examinations

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

Prerequisites

Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions

Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

Learning Outcomes

The student will

- be able to apply game theoretic methods to complex strategic decision making problems
- understand computer aided methods to analyze stochastic decision making problems
- learn the theoretical foundations of decision theory under uncertainty
- be able to use experimental methods to analyze economic phenomena

Content

- Game Theory I
- Economics of Uncertainty
- Simulation
- Experimental Economics

Courses in module Decision Theory [IW3WWDEC0]

<table>
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<td>Game Theory II (S. 104)</td>
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<td>25662</td>
<td>Simulation I (S. 108)</td>
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<td>25365</td>
<td>Economics of Uncertainty (S. 103)</td>
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<td>S</td>
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<td>Experimental Economics (S. 105)</td>
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Remarks

The lecture Simulation I [25662] is offered irregularly. The curriculum of the next two years is available online.
Module: eBusiness Management

Subject: BA/OR/EC (Specialization)
Module coordination: Christof Weinhardt
Credit points (CP): 20

Learning Control / Examinations
Learning control is described in the course documents associated to this module. The overall grade is determined by weighting the grades from each course according to the number of credits.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
• At least two of the three courses “Management of Business Networks” [26452] and “eFinance: Information Engineering and Management for Securities Trading” [26454] and “eServices” [26462] are compulsory.
• Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.
• At most one seminar can be considered in this module.
• The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [SemiIW] and it can only be chosen in conjunction with the course.

Learning Outcomes
The module eBusiness Management supplies students with knowledge and abilities for designing information (products and processes) in a strategic and operative way as well as with knowledge about the information and communication systems in enterprises and networks. The students shall be able to analyze coordination problems within and - above all - between enterprises, to judge them and to support them by installing appropriate information services. On the one hand, a deep understanding of information as a production factor and an economic good is necessary. On the other hand, students shall know the methods of information management and business model planning. Besides the theoretical aspects, skills such as the capacity for teamwork, intercultural cooperation and applying theoretical knowledge in practice are trained.

Content
The module “eBusiness Management” 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 “Management of Business Networks”, “eFinance: Information engineering and management in finance” and “eServices” constitute three different application domains in which the basic principles of the Internet Economy are deepened. In the course “Management of Business Networks” the focus is set on the strategic aspects of management and information systems. It is held in English and teaches parts of the syllabus with the support of a case study elaborated with Prof Kersten from Concordia University, Montreal, Canada. If it is possible to organize, depending on the start of term in Canada, the case study will be worked on by the students via internet in collaboration with Canadian students. The results will jointly be presented in a telephone conference. The course “eFinance: information engineering and management 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 core program is complemented by further elective courses that deliver knowledge about methodology in the field of incentive engineering and coordination of business networks and supply chains.
### Courses in module *eBusiness Management* [IW3WWEBM0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
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<tr>
<td>26452</td>
<td>Management of Business Networks (S. 136)</td>
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<td>W</td>
<td>5</td>
<td>Weinhardt, Kraemer</td>
</tr>
<tr>
<td>26454</td>
<td>eFinance: Information Engineering and Management for Securities Trading (S. 137)</td>
<td>2/1</td>
<td>W</td>
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<td>Weinhardt, Riordan</td>
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<tr>
<td>26466</td>
<td>eServices (S. 138)</td>
<td>2/1</td>
<td>S</td>
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<td>Weinhardt, Satzger</td>
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<td>26240</td>
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<td>W</td>
<td>5</td>
<td>Mitusch</td>
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<tr>
<td>21078</td>
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<td>6</td>
<td>Furmans</td>
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</tr>
</tbody>
</table>

**Remarks**

The lecture *Competition in Networks* [26240] is always offered in the winter term, starting with the term of winter 2009/10. The current seminar courses for this semester are listed on following webpage: the [http://www.im.uni-karlsruhe.de/lehre](http://www.im.uni-karlsruhe.de/lehre)
Module: Supply Chain Management

Subject: BA/OR/EC (Specialization)
Module coordination: Christof Weinhardt
Credit points (CP): 10

Learning Control / Examinations
Learning control is described in the course documents associated to this module. The overall grade is determined by weighting the grades from each course according to the number of credits.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- The core courses Management of Business Networks [26452] is compulsory. In addition, students have to choose further elective courses from the list below so that the number of credits equals or exceeds 10.
- The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [SemIW] and it can only be chosen in conjunction with this course.
- At most one seminar can be considered in this module.
- Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

Learning Outcomes
The module “Supply Chain Management” imparts knowledge for strategic and operative designing and control of supply chains spanning several enterprises. The students shall be able to analyze the coordination problems within supply chains, to judge them and to support them providing appropriate information systems. In order to be able to do this it is necessary to understand the coordination and planning mechanisms from the field of Operations Research and, on the other hand, to be familiar with methods from information management. Thus, the module gives an overview of methods and instruments of Supply Chain Management for the strategical, organizational and technical design of integrated supply chains.

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 “Management of Business Networks” the focus is set on the strategic aspects of management and information systems. The course is held in English and teaches parts of the syllabus with the support of a case study elaborated with Prof Kersten from Concordia University, Montreal, Canada. If it is possible to organize, depending on the start of term in Canada, the case study will be worked on by the students via internet in collaboration with Canadian students. The results will jointly be presented in a telephone conference. The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

Courses in module Supply Chain Management [IW3WWEBM1]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week C/E/T</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26452</td>
<td>Management of Business Networks (S. 136)</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Weinhardt, Kraemer</td>
</tr>
<tr>
<td>21078</td>
<td>Logistics (S. 77)</td>
<td>3/1</td>
<td>S</td>
<td>6</td>
<td>Furmans</td>
</tr>
<tr>
<td>25486</td>
<td>Facility Location and Strategic Supply Chain Management (S. 106)</td>
<td>2/1</td>
<td>S</td>
<td>4.5</td>
<td>Nickel</td>
</tr>
<tr>
<td>SemiW</td>
<td>Seminar Information Engineering and Management (S. 154)</td>
<td>2</td>
<td>W/S</td>
<td>4</td>
<td>Weinhardt</td>
</tr>
<tr>
<td>26477</td>
<td>Practical seminar Information Engineering and Management (S. 139)</td>
<td>0*</td>
<td>W/S</td>
<td>1</td>
<td>Weinhardt</td>
</tr>
</tbody>
</table>

Remarks
The lecture Facility Location and Strategic Supply Chain Management is first offered in the winter term 2009/10 within the module.

The current seminar courses for this semester are listed on following webpage: the http://www.im.uni-karlsruhe.de/lehre
Module: eFinance: Information Engineering and Management in Finance  
Module key: [IW3WWEBM2]

Subject: BA/OR/EC (Specialization)  
Module coordination: Christof Weinhardt  
Credit points (CP): 10

Learning Control / Examinations  
Learning control is described in the course documents associated to this module. The overall grade is determined by weighting the grades from each course according to the number of credits.

Prerequisites  
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions  
- The core courses eFinance [26454] is compulsory. In addition, students have to choose further elective courses from the list below so that the number of credits equals or exceeds 10.
- The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [SemIW] and it can only be chosen in conjunction with this course.
- At most one seminar can be considered in this module.
- Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

Learning Outcomes  
In the module “eFinance: Information engineering and management in finance” the students get an overview of modern approaches of information management in the finance sector. They learn to analyze specific financial problems from the point of view of information management and also to solve these problems by using the tools provided by information management. By doing so, they get to know finance products as information products and learn the state of the art of modern information processing in the finance sector.

Content  
The module “eFinance: Information engineering and management in finance” addresses current problems in the finance sector. It is investigated the role of information and knowledge in the finance sector and how information systems can solve or extenuate them. Speakers from practice will contribute to lectures with their broad knowledge. Core courses of the module deal with the background of banks and insurance companies and the electronic commerce of stocks in global finance markets. Information management topics are in the focus of the lecture “eFinance: information engineering and management for securities trading”. For the functioning of the international finance markets, it is necessary that there is an efficient information flow. Also, the regulatory frameworks play an important role. In this context, the role and the functioning of (electronic) stock markets, online brokers and other finance intermediaries and their platforms are presented. Not only IT concepts of German finance intermediaries are presented, but also international system approaches will be compared. The lecture is supplemented by speakers from the practice (and excursions, if possible) coming from the Deutsche Börse and the Stuttgart Stock Exchange.

Courses in module eFinance: Information Engineering and Management in Finance [IW3WWEBM2]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>26454</td>
<td>eFinance: Information Engineering and Management for Securities Trading</td>
<td>2/1</td>
<td>W</td>
<td>5</td>
<td>Weinhardt, Riordan</td>
</tr>
<tr>
<td>25762</td>
<td>Intelligent Systems in Finance</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Seese</td>
</tr>
<tr>
<td>25240</td>
<td>Market Microstructure</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Lüdecke</td>
</tr>
<tr>
<td>26550</td>
<td>Derivatives</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
<tr>
<td></td>
<td>Seminar Information Engineering and Management</td>
<td>2</td>
<td>W/S</td>
<td>4</td>
<td>Weinhardt</td>
</tr>
<tr>
<td>26477</td>
<td>Practical seminar Information Engineering and Management</td>
<td>0*</td>
<td>W/S</td>
<td>1</td>
<td>Weinhardt</td>
</tr>
</tbody>
</table>

Remarks  
The lecture Derivatives will be first offered in this module in the summer term 2010.
The current seminar courses for this semester are listed on following webpage: the http://www.im.uni-karlsruhe.de/lehre
Module: Applied Finance

Subject: BA/OR/EC (Specialization)
Module coordination: Marliese Uhrig-Homburg
Credit points (CP): 20

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.

Seminars of all examiners of this module will be accepted.

Learning Outcomes
This module provides profound knowledge in modern finance. Apart from investment decisions in stock and bond markets, valuation problems and the use of derivative financial instruments are examined/discussed. The knowledge about the micro economic fundament of modern finance theory can be enhanced by choosing an economics lecture concerning decisions under uncertainty and the economics of information. Alternatively computer based simulation, which is important for many valuation issues, can be studied by choosing a lecture in operations research.

Content
- Capital Market Theory
- Derivatives
- Statistics and Econometrics in Business and Economics
  Part 1: Introduction to Securities and Markets: Stock and Dividend Statistical Description as Binomial Model, Wiener’s and Itô’s Disturbance Process; Portfolio Management involving Markowitz Model, Tobin Model, another Stochastic Models; The CAPM and APT Models; The Mathematical Description and Term Structure of Interest Rates; Bond Portfolio Management involving Immunization; Option Pricing involving European and American Pricing, Black-Scholes Formula, Option Hedging and Speculation Strategies.
  Part 2: Time-Series Models Definitions and Main Problems; Stationary; Smoothing; AR(p)-Models; MA(p)-Models; ARMA(p,q)-Models; ARCH and GARCH Models; ARIMA-Model; Seasonal Models; Lag Structures; Estimation and Checking Time-Series Models; Forecasting with time-Series Models; Forecasting Adapted Methods; Applications of Time-Series Models.
- Ökonomische Theorie der Unsicherheit
  Axiomatice Entscheidungstheorien (Neumann/Morgenstern, Kahnemann/Tversky), Stochastische Dominanz von Verteilungen, Risikoaversions-Konzepte, Marktmmodelle bei Unsicherheit und unvollständiger Information, experimentelle Überprüfung der theoretischen Resultate.
- Simulation
- Seminar
  Changing up to date topics, related to the contents of the lectures.

Courses in module Applied Finance [IW3WWFIN0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
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<tbody>
<tr>
<td>26575</td>
<td>Investments (S. 146)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
<tr>
<td>26550</td>
<td>Derivatives (S. 145)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
<tr>
<td>25325</td>
<td>Statistics and Econometrics in Business and Economics (S. 102)</td>
<td>2/2</td>
<td>W</td>
<td>5</td>
<td>Heller</td>
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<tr>
<td>25365</td>
<td>Economics of Uncertainty (S. 103)</td>
<td>2/2</td>
<td>S</td>
<td>6</td>
<td>Ehrhart</td>
</tr>
<tr>
<td>25662</td>
<td>Simulation I (S. 108)</td>
<td>2/1/2</td>
<td>W</td>
<td>5</td>
<td>Waldmann</td>
</tr>
<tr>
<td>25016</td>
<td>Economics III: Introduction in Econometrics (S. 95)</td>
<td>2/2</td>
<td>S</td>
<td>5</td>
<td>Höchstötter</td>
</tr>
<tr>
<td>26580</td>
<td>Seminar in Financial Engineering (S. 147)</td>
<td>2</td>
<td>W</td>
<td>3</td>
<td>Uhrig-Homburg</td>
</tr>
</tbody>
</table>
Remarks
The lecture *Simulation I* [25662] is offered irregularly. The curriculum of the next two years is available online.
Module: Financial Economics  
Module key: [IW3WWFIN1]  

**Subject:** BA/OR/EC (Specialization)  
**Module coordination:** Marliese Uhrig-Homburg  
**Credit points (CP):** 10  

**Learning Control / Examinations**  
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

**Prerequisites**  
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

**Conditions**  
Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

**Learning Outcomes**  
This module teaches profound knowledge in modern finance and its microeconomic foundation. The focus is on investment decisions in stock and bond markets.

**Content**
- Capital Market Theory  
- Ökonomische Theorie der Unsicherheit  
  Axiomatische Entscheidungstheorien (Neumann/Morgenstern, Kahnemann/Tversky), Stochastische Dominanz von Verteilungen, Risikoaversions-Konzepte, Marktmodelle bei Unsicherheit und unvollständiger Information, experimentelle Überprüfung der theoretischen Resultate.

**Courses in module Financial Economics [IW3WWFIN1]**

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>25365</td>
<td>Economics of Uncertainty (S. 103)</td>
<td>2/2</td>
<td>S</td>
<td>6</td>
<td>Ehrhart</td>
</tr>
<tr>
<td>26575</td>
<td>Investments (S. 146)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
</tbody>
</table>
Module: Quantitative Finance

Subject: BA/OR/EC (Specialization)
Module coordination: Marliese Uhrig-Homburg
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

Learning Outcomes
This module deals with valuation problems and the use of derivative financial instruments. The theoretical basics of valuation in discrete and continuous time are taught, as well as the necessary knowledge in (computer based) simulation, which is needed for practical applications.

Content

Courses in module Quantitative Finance [IW3WWFIN2]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible</th>
</tr>
</thead>
<tbody>
<tr>
<td>26550</td>
<td>Derivatives (S. 145)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
<tr>
<td>25662</td>
<td>Simulation I (S. 108)</td>
<td>2/1/2</td>
<td>W</td>
<td>5</td>
<td>Waldmann</td>
</tr>
</tbody>
</table>

Remarks
The lecture Simulation I [25662] is offered irregularly. The curriculum of the next two years is available online.
Module: Financial Markets

Subject: BA/OR/EC (Specialization)
Module coordination: Marliese Uhrig-Homburg
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module or of the other BA/OR/EC module has to be chosen and completed.

Learning Outcomes
The module teaches basics of price formation and microstructure of financial markets. Besides basic questions of the evaluation of investment decisions on stock and bond markets it is analyzed how structural properties of a financial market affect the price formation process and the qualitative properties of financial markets.

Content
- Capital Market Theory
- Marktstruktur
  Historischer Überblick, Struktur- und Qualitätsmerkmale von Finanzmärkten, Preisbildung auf Händler- und Auktionsmärkten, Auswirkungen asymmetrischer Information, kurzfristiges Zeitreihenverhalten von Marktpreisen.
- Seminar
  Changing up to date topics, related to the contents of the lectures.

Courses in module Financial Markets [IW3WWFIN3]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25240</td>
<td>Market Microstructure (S. 101)</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Lüdecke</td>
</tr>
<tr>
<td>26580</td>
<td>Seminar in Financial Engineering (S. 147)</td>
<td>2</td>
<td>W</td>
<td>3</td>
<td>Uhrig-Homburg</td>
</tr>
<tr>
<td>26575</td>
<td>Investments (S. 146)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Uhrig-Homburg</td>
</tr>
</tbody>
</table>
Module: Foundations of Marketing

Module key: [IW3WWMAR1]

Subject: BA/OR/EC (Specialization)
Module coordination: Wolfgang Gaul, Bruno Neibecker
Credit points (CP): 10

Learning Control / Examinations
The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from the main lecture [25150] as well as from the chosen lectures [25154], [25156], [25177]. The examination is offered every semester. Re-examinations are offered at every ordinary examination date and has to be absolved within one year.

The overall grade for the module is the average of the grades for each course weighted by the credits of the course. It is recommended, to attend more lectures than required to fulfill 10 Credit Points as it is possible to examine in these additional lectures and influence the final grade positively.

If a Seminar is attended within the module, the assessment for this course is done individually (according to §4, Abs. 2, Nr. 3 of the examination regulation). The grade of the seminar is taking into account for the overall grade of the module.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
The lecture Marketing and Consumer Behavior [25150] has to be attended.

Learning Outcomes

Content

Courses in module Foundations of Marketing [IW3WWMAR1]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
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</thead>
<tbody>
<tr>
<td>25150</td>
<td>Marketing and Consumer Behavior (S. 96)</td>
<td>2/1 W</td>
<td>5</td>
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<td>Gaul</td>
</tr>
<tr>
<td>25154</td>
<td>Modern Market Research (S. 97)</td>
<td>2/1 S</td>
<td>5</td>
<td></td>
<td>Gaul</td>
</tr>
<tr>
<td>25156</td>
<td>Marketing and Operations Research (S. 98)</td>
<td>2/1 S</td>
<td>5</td>
<td></td>
<td>Gaul</td>
</tr>
<tr>
<td>25177</td>
<td>Brand Management (S. 100)</td>
<td>2/1 W</td>
<td>4</td>
<td></td>
<td>Neibecker</td>
</tr>
</tbody>
</table>
Module: Strategy and Managerial Economics

**Subject:** BA/OR/EC (Specialization)
**Module coordination:** Hagen Lindstädt
**Credit points (CP):** 20

**Learning Control / Examinations**
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

**Prerequisites**
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules *Internship* [IW1EXPRAK] and *Business and Public Law* [IW1INJURA] are not relevant in this calculation.

**Conditions**
- Students must take the courses [25900] and [25525].
- Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.

The remaining courses are completely optional, but only one seminar.

**Learning Outcomes**
The module provides knowledge and skills about economic models and management frameworks in management, strategy, and organization.
The module focuses on problem solving skills and understanding fundamental economic concepts in the area of corporate and business management.

**Content**
The module emphasises three aspects: The student will learn models and frameworks, which are used in strategic and managerial decisions and managing organizations. The module also deals with practical aspects of these topics.

### Courses in module *Strategy and Managerial Economics* [IW3WWORG0]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25900</td>
<td>Management and Strategy (S. 121)</td>
<td>2/0</td>
<td>S</td>
<td>4</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>25525</td>
<td>Game Theory I (S. 107)</td>
<td>2/2</td>
<td>S</td>
<td>6</td>
<td>Berninghaus</td>
</tr>
<tr>
<td>25907</td>
<td>Special Topics in Management: Management and IT (S. 122)</td>
<td>1/0</td>
<td>W/S</td>
<td>2</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>25908</td>
<td>Modeling Strategic Decision Making (S. 123)</td>
<td>2/1</td>
<td>S</td>
<td>6</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>26291</td>
<td>Managing New Technologies (S. 135)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Reiß</td>
</tr>
<tr>
<td>25915</td>
<td>Seminar: Management and Organization (S. 124)</td>
<td>2</td>
<td>S</td>
<td>4</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>25916</td>
<td>Seminar: Management and Organization (S. 125)</td>
<td>2</td>
<td>W</td>
<td>4</td>
<td>Lindstädt</td>
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<tr>
<td>SemWIOR4</td>
<td>Seminar in Game and Decision Theory (S. 156)</td>
<td>2</td>
<td>W/S</td>
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<tr>
<td>SemWIOR3</td>
<td>Seminar in Experimental Economics (S. 155)</td>
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<td>W/S</td>
<td>4</td>
<td>Berninghaus</td>
</tr>
</tbody>
</table>

**Remarks**
Module: Strategy and Interaction

Module key: [IW3WWORG1]

Subject: BA/OR/EC (Specialization)
Module coordination: Hagen Lindstädt
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Students must take both courses.
Following § 17, 3 of „Prüfungsordnung Informationswirtschaft“ a seminar of the other BA/EC/OR module has to be chosen and completed.

Learning Outcomes
The module provides knowledge and skills about economic models and management frameworks in strategic management, game theory, and the dynamics of interaction.
The module focuses on problem solving skills and understanding fundamental economic concepts in the area of strategy, management, and economics.

Content
The module emphasises two aspects: The student will learn to apply strategy frameworks, which are used in strategic and managerial decisions. Additionally, the module deals with problems and questions concerning game theory.

Courses in module Strategy and Interaction [IW3WWORG1]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
</tr>
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<tbody>
<tr>
<td>25900</td>
<td>Management and Strategy (S. 121)</td>
<td>2/0</td>
<td>S</td>
<td>4</td>
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<tr>
<td>25525</td>
<td>Game Theory I (S. 107)</td>
<td>2/2</td>
<td>S</td>
<td>6</td>
</tr>
</tbody>
</table>

Responsible Lecturer(s)
- Lindstädt
- Berninghaus
Module: Modeling Strategic Decision Making and Economic Incentives

Module key: [IW3WWORG2]

Subject: BA/OR/EC (Specialization)
Module coordination: Hagen Lindstädt
Credit points (CP): 10

Learning Control / Examinations
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
Students must choose two out of the five courses, but only one seminar. Following § 17, 3 of „Prüfungsordnung Informationswirtschaft“ a seminar of this module or of the other BA/EC/OR module has to be chosen and completed.

Learning Outcomes
The module provides knowledge and skills about economic models and management frameworks in strategic decision making and economic incentives.
The module focuses on problem solving skills and understanding fundamental economic concepts in the area of strategic management and economics.

Content
The module emphasises two aspects: The student will learn models and frameworks, which are used in strategic and managerial decision making. Additionally, the module deals with problems and questions concerning economic incentives as an important part in strategic and organizational management.

Courses in module Modeling Strategic Decision Making and Economic Incentives [IW3WWORG2]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25908</td>
<td>Modeling Strategic Decision Making (S. 123)</td>
<td>2/1</td>
<td>S</td>
<td>6</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>26291</td>
<td>Managing New Technologies (S. 135)</td>
<td>2/1</td>
<td>S</td>
<td>5</td>
<td>Reiß</td>
</tr>
<tr>
<td>25915</td>
<td>Seminar: Management and Organization (S. 124)</td>
<td>2</td>
<td>S</td>
<td>4</td>
<td>Lindstädt</td>
</tr>
<tr>
<td>25916</td>
<td>Seminar: Management and Organization (S. 125)</td>
<td>2</td>
<td>W</td>
<td>4</td>
<td>Lindstädt</td>
</tr>
</tbody>
</table>
Module: Industrial Production

Subject: BA/OR/EC (Specialization)
Module coordination: Frank Schultmann
Credit points (CP): 20

Learning Control / Examinations
There will be a written exam for all courses together.

Prerequisites
Successful completion of the modules in semester 1–4 (key: [IW1...]) except for up to two modules. The modules Internship [IW1EXPRAK] and Business and Public Law [IW1INJURA] are not relevant in this calculation.

Conditions
- The courses [25950], [25952], [25954] are obligatory.
- Following §17, 3 of the examination regulation for Information Engineering and Management, a seminar of this module has to be chosen and completed.

The courses are conceived as independent ones, such that they can be followed in any order.

Learning Outcomes
Objectives of the courses are:
- Techno-economic assessment of trends in development and of new production techniques (industrial research and development (R&D), innovation processes, diffusion processes),
- Techno-economic assessment of productionsystems, technology assessment, technology transfer,
- Design and optimisation of production and logistic systems:
  - Optimal layout of machines / equipment / plants,
  - Production optimisation (PPC, CIM, ERP- and supply chain management systems).

Content
The courses in the field “Industrial Production” deal with the planning and implementation of all business tasks in relation with the production of goods. In addition to the production industries, energy supply and construction are covered in the courses. Besides the desired products, emissions arise during the supply, transformation, storage and transport of goods. Therefore, special emphasis is put on aspects of environmental protection and sustainability in relation with industrial production. The lectures begin with a practical way of looking at a problem at hand of selected case studies from different industrial sectors. Subsequently, models and mathematical approaches are introduced and discussed with regard to their effectiveness as for the case studies.

Courses in module Industrial Production [IW3WWPRO00]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>25950</td>
<td>Fundamentals of Production Management (S. 126)</td>
<td>2/2</td>
<td>S</td>
<td>5.5</td>
<td>Schultmann</td>
</tr>
<tr>
<td>25952</td>
<td>Planning and Management of Industrial Plants (S. 127)</td>
<td>2/2</td>
<td>W</td>
<td>5.5</td>
<td>Schultmann</td>
</tr>
<tr>
<td>25954</td>
<td>Production and Logistics Management (S. 128)</td>
<td>2/2</td>
<td>S</td>
<td>5.5</td>
<td>Fröhling, Schultmann</td>
</tr>
<tr>
<td>25963</td>
<td>The Management of R&amp;D Projects with Case Studies (S. 131)</td>
<td>2/2</td>
<td>W/S</td>
<td>3.5</td>
<td>Schmied</td>
</tr>
<tr>
<td>25975</td>
<td>Computer-based Planning and Control of Production and Simulation of Processes (S. 132)</td>
<td>2/0</td>
<td>S</td>
<td>3.5</td>
<td>Fröhling, Möst, Schultmann</td>
</tr>
<tr>
<td>25960</td>
<td>Material and Energy Flows in the Economy (S. 129)</td>
<td>2/0</td>
<td>W</td>
<td>3.5</td>
<td>Hiete</td>
</tr>
<tr>
<td>25962</td>
<td>Exhaust Emissions (VWL), Emissions into the Environment (ING) (S. 130)</td>
<td>2/0</td>
<td>W</td>
<td>3.5</td>
<td>Karl</td>
</tr>
<tr>
<td>25995</td>
<td>Material Flow Analysis and Life Cycle Assessment (S. 133)</td>
<td>2/0</td>
<td>W</td>
<td>3.5</td>
<td>Schebek</td>
</tr>
<tr>
<td>SemIP2</td>
<td>Seminar in Industrial Production (S. 153)</td>
<td>2</td>
<td>W/S</td>
<td>4</td>
<td>Schultmann, Fröhling, Hiete</td>
</tr>
</tbody>
</table>
6.3 Law

Module: Intellectual Property and Data Protection Law  
Module key: [IW3INJURA]

Subject: Law (Specialization)  
Module coordination: Thomas Dreier  
Credit points (CP): 10

Learning Control / Examinations
The module will be examined as follows:
1. written exam (§4(2), 1) of 45 minutes covering the course Industrial and intellectual property law (3 CP),
2. written exam (§4(2), 1) of 45 Minutes covering the course data protection law (3 CP),
3. and a written paper and oral presentation (§4(2), 3) in a legal seminar (4 CP).

The grade of the module will be calculated according to the grades obtained, weighed according to the number of CPs of each course.

Prerequisites
Students must have completed all except a maximum of one of the three examinations of Module Law [IW1INJURA] - written exam (§ 4(2), 1 of the SPO) covering Civil Law for Beginners, certificate with grades (§ 4(2), 3 of the SPO) in Exercises in Private Law, and written exam (§ 4(2), 1 of the SPO) covering Public Law I and Public Law II.

Conditions
None.

Learning Outcomes
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. In addition, students shall learn to apply what they have learned in a written paper that will be presented and discussed in class.

Content
The module Law in the third year of the Bachelor studies comprises specialised courses in contract drafting, industrial and intellectual property law and data protection law. In addition, students have to participate in a seminar, where they will write a paper to presented and discussed in class.

Courses in module Intellectual Property and Data Protection Law [IW3INJURA]

<table>
<thead>
<tr>
<th>ID</th>
<th>Course</th>
<th>Hours per week</th>
<th>Term</th>
<th>CP</th>
<th>Responsible Lecturer(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>24070</td>
<td>Industrial Property and Copyright Law (S. 79)</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Dreier</td>
</tr>
<tr>
<td>24018</td>
<td>Data Protection Law (S. 78)</td>
<td>2/0</td>
<td>W</td>
<td>3</td>
<td>Spiecker genannt Döhmann</td>
</tr>
<tr>
<td>rechtsem</td>
<td>Seminar in Law (S. 158)</td>
<td>2</td>
<td>W/S</td>
<td>4</td>
<td>Dreier, Sester, Spiecker genannt Döhmann</td>
</tr>
<tr>
<td>24350</td>
<td>Europäische Entwicklungen im Informationsrecht (S. 90)</td>
<td>2/0</td>
<td>W/S</td>
<td>4</td>
<td>Brühann</td>
</tr>
</tbody>
</table>
6.4 General Modules

Module: Bachelor Thesis

Module key: [IW3IWBATHESIS]

Subject: nicht kategorisiert

Module coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften), Der Vorsitzende des Prüfungsausschusses

Credit points (CP): 12

Learning Control / Examinations
The Bachelor thesis is examined by an examiner following the examination regulation.

Prerequisites
Students may start with the Bachelor thesis if they fulfill the following preconditions: They are in the 3rd year of the Bachelor programme and have passed all examinations necessary for the first two years as defined in §17 paragraph 2 of the examination regulation of the Bachelor degree programme Information Engineering and Management.

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

Learning Outcomes
The student
- investigates a problem in information engineering and management autonomously and scientifically,
- searches for scientific literature for his problem,
- chooses and applies suitable scientific methods or develops and improves such methods,
- critically compare and evaluate his findings with the state of the art,
- communicates his results clearly and in a scientific form in his bachelor thesis.

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 maximal project time is 9 months. The Bachelor thesis may also be written in English.

Remarks
None.
7 Courses

7.1 Courses of term 1-4

Course: Grundbegriffe der Informatik

Course key: [24001]

Lecturers: Thomas Worsch
Credit points (CP): 4  Hours per week: 2/1/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Informatics 1 [IW1ININF1] (S. 13)

Learning Control / Examinations

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Basic literature
None.

Complementary literature

• Goos: Vorlesungen über Informatik, Band 1, Springer, 2005
• Abeck: Kursbuch Informatik I, Universitätsverlag Karlsruhe, 2005
Course: Programming

Lecturers: Gregor Snelting
Credit points (CP): 4  Hours per week: 2/0/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Informatics 1 [IW1ININF1] (S. 13)

Learning Control / Examinations
See german version.

Prerequisites
None.

Conditions
None.

Learning Outcomes
See german version.

Content
See german version.

Basic literature

Complementary literature
B. Eckels: Thinking in Java. Prentice Hall 2006
J. Bloch: Effective Java, Addison-Wesley 2008
Course: Algorithms I  

**Lecturers:** Peter Sanders  
**Credit points (CP):** 8  
**Hours per week:** 3/1/2  
**Term:** Sommersemester  
**Level:** 1  
**Teaching language:** Deutsch  
**Part of the modules:** Informatics 2 [IW1ININF2] (S. 14)  

**Learning Control / Examinations**  
**Prerequisites**  
None.  

**Conditions**  
None.  

**Learning Outcomes**  

**Content**  

**Basic literature**  
Algorithms and Data Structures – The Basic Toolbox  
K. Mehlhorn und P. Sanders  
Springer 2008  

**Complementary literature**  
Algorithmen - Eine Einführung  
T. H. Cormen, C. E. Leiserson, R. L. Rivest, und C. Stein  
Oldenbourg, 2007  

Algorithmen und Datenstrukturen  
T. Ottmann und P. Widmayer  
Spektrum Akademischer Verlag, 2002  

Algorithmen in Java. Teil 1-4: Grundlagen, Datenstrukturen, Sortieren, Suchen  
R. Sedgewick  
Pearson Studium 2003  
Algorithm Design  
J. Kleinberg and É. Tardos  
Addison Wesley, 2005  
Vöcking et al.  
Taschenbuch der Algorithmen  
Springer, 2008
Course: Theoretische Grundlagen der Informatik  

Course key: [theogrundinfo]

Lecturers: Jörn Müller-Quade
Credit points (CP): 8  
Hours per week: 3/1  
Term: Wintersemester  
Level: 2  
Teaching language: Deutsch  
Part of the modules: Informatics 3 [IW1INF3] (S. 16)

Learning Control / Examinations
The assessment is described in the module.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Complementary literature
Course: Rechnerorganisation

Lecturers: Tamim Asfour, Rüdiger Dillmann, Jörg Henkel, Wolfgang Karl
Credit points (CP): 6  Hours per week: 3/1/2
Term: Sommersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Computer Engineering [IW1INTINF] (S. 18)

Learning Control / Examinations
The assessment is described in the module.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Complementary literature
  • D. Patterson, J. Hennessy: Rechnerorganisation und -entwurf
  • Th. Flick, H. Liebig: Mikroprozessortechnik; Springer-Lehrbuch, 5. Auflage 1998
Course: Computer Engineering II

Lecturers: Wolfgang Karl
Credit points (CP): 6  Hours per week: 3/1/2
Term: Sommersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Computer Engineering [IW1INTINF] (S. 18)

Learning Control / Examinations
Assessment will consist of an 1h written exam following §4, Abs. 2, 1 of the SPO.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The goal of the course is to introduce the principles for the design and organization of computers. The emphasis in this course is to show the relationship between hardware and software and to focus on the concepts that are the basics for current computers. The audience should understand how computing systems work and how programs run efficiently on modern computers.

Content
The course begins with a historical perspective of computer architectures and processors. It then shows the hardware/software interface and the requirements of high-level programming languages for the instruction set architecture. The organization and components of computers, their functionality and interoperability are then described. Finally, the impact of the hardware concepts on the software is discussed in order to demonstrate why a system performs as it does.

Media
Slides

Basic literature

Complementary literature
Course: Applied Informatics I - Modelling

Lecturers: Andreas Oberweis, Rudi Studer, Sudhir Agarwal
Credit points (CP): 4  Hours per week: 2/1
Term: Wintersemester  Level: 2
Teaching language: Deutsch
Part of the modules: Applied Informatics [IW1WWAINF] (S. 17)

Learning Control / Examinations
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.

Conditions
None.

Learning Outcomes
Basic knowledge about the strengths and weaknesses of various modeling approaches including their application areas.

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 as well as event driven process chains together with their respective analysis techniques will be introduced.

Media
Slides.

Basic literature

Complementary literature
Course: Applied Informatics II - IT Systems for e-Commerce  Course key: [25033]

Lecturers: Stefan Tai  
Credit points (CP): 4  Hours per week: 2/1  
Term: Sommersemester  Level: 2  
Teaching language: Deutsch  
Part of the modules: Applied Informatics [IW1WWAINF] (S. 17)

Learning Control / Examinations
The assessment consists of a written examination (60 min) according to Section 4 (2),1 of the examination regulation. The grade of Applied Informatics II is the achieved grade in the written examination.

Prerequisites
Knowledge of content of the courses Foundations of Informatics I [25074] and Foundations of Informatics II [25076] is expected.

Conditions
None.

Learning Outcomes
The student learns about IT methods and systems in support of modern electronic commerce. The student should be able to select, assess, design, and apply these methods and systems in a context-sensitive manner.

Content
The course introduces methods and systems in support of electronic commerce, including the topics:
  • application architectures (incl. client server architectures)
  • document description and exchange (incl. XML)
  • enterprise middleware (incl. CORBA, Messaging Middleware, Java Enterprise Edition)
  • Web services and SOA

Media
Slides, internet resources.

Basic literature
Tba in the lecture.
Course: Financial Accounting and Cost Accounting  
Course key: [25002/25003]

Lecturers: Thomas Burdelski
Credit points (CP): 4  Hours per week: 2/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Business Administration [IW1WWBWL] (S. 19)

Learning Control / Examinations
The assessment will consist of a written exam following §4(2), 3 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Business transactions are economic events that affect the financial position of a business entity. After this basic course students have to be familiar with the principles of Financial and Management Accounting especially with the four financial statements and the instruments of a cost accounting system.

Content
After an introduction to the objectives of accounting the student will learn the double-entry system, the basic method of accounting, and the difference between accounting and bookkeeping. We examine the typical business transactions for Trading Companies and Industrial Enterprises. Financial statements are the primary means of communicating important accounting information about a business to those who have an interest in the business. Four major financial statements are used to communicate accounting information: the income statement, the statement of retained earnings, the balance sheet and the statement of cash flows, here in the context with German laws (HGB). In the second part of the course the cost accounting instruments will be analyzed: cost type accounting, cost center accounting, and unit of output costing. Aspects of modern systems in Management Accounting conclude this basic course.

Media
slides

Basic literature
- R. Buchner, Buchführung und Jahresabschluss, Vahlen Verlag
- A. Coenenberg, Jahresabschluss und Jahresabschlussanalyse, Verlag Moderne Industrie
- A. Coenenberg, Kostenrechnung und Kostenanalyse, Verlag Moderne Industrie
- R. Ewert, A. Wagenhofer, Interne Unternehmensrechnung, Springer Verlag
- J. Schöttler, R. Spulak, Technik des betrieblichen Rechnungswesen, Oldenbourg Verlag
Course: Introduction to Information Engineering and Management    \[\text{Course key: [26490]}\]

Lecturers: Christof Weinhardt, Andreas Geyer-Schulz
Credit points (CP): 3  \[\text{Hours per week: 2/2}\]
Term: Sommersemester  \[\text{Level: 1}\]
Teaching language: Deutsch
Part of the modules: Business Administration [IW1WWBWL] (S. 19)

Learning Control / Examinations
The assessment of the course Introduction to Information Engineering and Management is an assessment according to §4(2), 3 of the examination regulation of the Bachelor programme in Information Engineering and Management.

The assessment consists of two parts:

- Examination in written form with a duration of 60 minutes and 90 points
- Written report about one exercise case: 10 points.

The grades are allocated on the basis of the following table:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimal Points for Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>87</td>
</tr>
<tr>
<td>1.3</td>
<td>83</td>
</tr>
<tr>
<td>1.7</td>
<td>79</td>
</tr>
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<td>2.0</td>
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<td>2.3</td>
<td>71</td>
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<td>55</td>
</tr>
<tr>
<td>4.0</td>
<td>&gt; 50</td>
</tr>
<tr>
<td>4.7</td>
<td>40</td>
</tr>
<tr>
<td>5.0</td>
<td>0</td>
</tr>
</tbody>
</table>

Prerequisites
None.

Conditions
None.

Learning Outcomes
The student

- is able to handle interdisciplinary case studies of information management and engineering and to consider the impact of juridical framework of information technology on the design of business processes.
- knows the basic principles of venture creation, capital budgeting and outsourcing.
- can develop and design venture creation and independently develop and create a business plan with external help.
- knows the fundamentals of strategic and operative marketing and logistic systems.
- can model and analyze dynamic systems.
- can apply with external help causal loop diagrams and methods from System Dynamics to a well defined business problem, describe system behavior and analyze the consequences of decisions on the system behavior.
- learns to work team-oriented and independently in small groups, learns English terminology in the context of information management and he is able to read and comprehend international literature to solve the tutorial assignments.

Content
The last years have seen the rise of information companies whose company purpose is the generation and distribution of informations. In these companies, as well as companies of the old economy, the role of information, communication, and their cost is increasing. Some of the problems related with this trend are presented and treated in-depth in the course Introduction to Information Engineering and Management.

The goal of this course is to present the foundation of information engineering and management and the necessary linking of the different disciplines in today’s information society. The course is completely motivated by authentic, real-world examples. With the help of these examples, the following topics as well as the interdependencies between business administration, economics, information technology, and law, are treated:

- The foundation of a company: Choosing the legal form and financing
- Financial planning and investment
- Information and information technology
- Outsourcing und horizontale Unternehmensintegration

Modulhandbuch: Stand 24.08.2009    Information Engineering and Management (B.Sc.) ER 2005
• Service Engineering
• Electronic markets
• Logistics/SCM
• Web/Internet-Marketing
• Production and Procurement

Media
Web, Audio/Slides, Full Text Documents.

Basic literature

Complementary literature
Course: Business Administration and Management Science B  Course key: [25024/25025]

Lecturers: Wolfgang Gaul, Thomas Lützkendorf, Andreas Geyer-Schulz, Christof Weinhardt, Thomas Burdelski

Credit points (CP): 4  Hours per week: 2/0/2  
Term: Sommersemester  Level: 1  
Teaching language: Deutsch

Part of the modules: Business Administration [IW1WWBWL] (S. 19)

Learning Control / Examinations

Prerequisites
None.

Conditions
None.

Learning Outcomes
The target of this course and the tutorials of this course are the basic points of marketing, production economics and information engineering and management. After this basic course students have to be familiar with these three topics in Business Administration and Management Science.

Content
1. Marketing:
Marketing is an organizational function to handle situations, activities, and processes for creating, communicating, and delivering value to customers in a best way. (Customer) relationship management comprises collecting, aggregating, and analyzing information (e.g., developments in the society, changing conditions of markets, alterations w.r.t. buying behavior) to benefit different target groups. Main topics will deal with market research and optimized application of marketing mix instruments with emphasis on “marketing and the web”, “innovation management”, and “international marketing”.

2. Production economics
In the part of production economics the student will learn basics in the field of production theory, procurement and resource acquisitions, production and operations management and industrial engineering. Aspects of electrical engineering industry, technological foresights, construction industry and real estate markets will be treated.

3. Information engineering and management
In today’s economy, information is a competitive factor that calls for an interdisciplinary investigation from economics and business administration, informatics and law. In this part of the lecture, selected topics from information engineering and management and their impact in market competition are presented. Topics include: Information in a company, Information processing: From an agent to business networks, social networks, service value networks, complex service auction, market engineering, physioeconomics, grid und cloud computing, dynamic pricing.

Basic literature
Further literature references are announced in the materials to the lecture.
Course: Business Administration and Management Science C  Course key: [25026/25027]

Lecturers: Hagen Lindstädt, Martin E. Ruckes, Marliese Uhrig-Homburg, Thomas Burdelski

Credit points (CP): 4  Hours per week: 2/0/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Business Administration [IW1WWBWL] (S. 19)

Learning Control / Examinations

Prerequisites
None.

Conditions
None.

Learning Outcomes

The goal of this course and the tutorials of this course is to equip students with the fundamentals and basics in the fields of management and organization, investment and finance and the German specific term controlling. After this course students have to be familiar with these three topics in business administration and management science.

Content

1. Management and Organization
A) Foundations of Management
B) Foundations of Strategic Management
   • Process of Strategic Management
   • Strategic Analysis using the SWOT Framework
   • Formulating Strategic Options
   • Evaluation and Choice
C) Foundations of Organization
   • Why do Organizations exist?
   • Objectives, Measures and Conditions of Managing Organizations
   • Level 1: Division of Labour and Design of Departments
   • Level 2: Choosing the Hierarchical Structure
   • Level 3: Coordination and Formalization
D) Agency-theoretic Foundations:
   • Organization under Asymmetric Organization
   • Three Types of Informational Asymmetries
   • Type 1: Hidden Intention and Holdup
   • Type 2: Hidden Characteristics and Adverse Selection
   • Type 3: Hidden Action and Moral Hazard

2. Investment and Finance

This part of the course deals with the fundamentals of capital market theory and provides a modern introduction to the theory and practice of capital raising and capital budgeting. These topics are covered:
   • Valuation of financial and real investments
   • Portfolio theory
   • Pricing in financial markets
   • Theory and practice of corporate finance
   • Arbitrage

3. Controlling

Planning, control (e.g. monitoring), organization, leadership and information systems are the core elements of a business management system. These fields have to be coordinated with one another to achieve the corporate goals in an optimal way. This coordinating function is the main task of the German specific term controlling. Thus, controlling fulfills the coordinating task within the management system in an essential way. These topics are covered:
   • Fundamentals of controlling and its context
   • Instruments of controlling for business planning and control/monitoring (selected operational instruments, benchmarking as a tactical instrument and portfolio analysis as a strategic instrument)
   • Instruments of controlling for information systems (performance indicators and reporting)

Basic literature

Extensive bibliographic information will be given in the materials to the lecture.
Course: Introduction to Operations Research I

Lecturers: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann

Credit points (CP): 4.5  Hours per week: 2/2/2

Term: Sommersemester  Level: 2

Teaching language: Deutsch

Part of the modules: Introduction to Operations Research [IW1WWOR] (S. 21)

Learning Control / Examinations

See module description.

Prerequisites

See module information.

Conditions

None.

Learning Outcomes

See module information.

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.

Media

Blackboard, slides, beamer presentations, lecture notes, OR software.

Basic literature

Lecture notes

Complementary literature

- Büning, Naeve, Trenkler, Waldmann: Mathematik für Ökonomen im Hauptstudium. Oldenbourg, 2000
Course: Introduction to Operations Research II

Lecturers: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann
Credit points (CP): 4.5  Hours per week: 2/2/2
Term: Wintersemester  Level: 2
Teaching language: Deutsch
Part of the modules: Introduction to Operations Research [IW1WWOR] (S. 21)

Learning Control / Examinations
See module description.

Prerequisites
See corresponding module information. Especially the course Introduction to Operations Research I [25040] is assumed.

Conditions
None.

Learning Outcomes
See module information.

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

Media
Blackboard, slides, beamer presentations, lecture notes, OR software

Basic literature
Lecture notes

Complementary literature
- Büning, Naeve, Trenkler, Waldmann: Mathematik für Ökonomen im Hauptstudium. Oldenbourg, 2000
Course: Economics I: Microeconomics  
Course key: [25512]

Lecturers: Siegfried Berninghaus
Credit points (CP): 5  Hours per week: 3/0/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Economics [IW1WWVWL] (S. 20)

Learning Control / Examinations
The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.
There may be offered a practice exam in the middle of the semester. The results of this exam may be used to improve the grade of the main exam. A detailed description of the examination modalities will be given by the respective lecturer.
The main exam takes place subsequent to the lecture. 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.

Prerequisites
None.

Conditions
None.

Learning Outcomes
It is the main aim of this course to provide basic knowledge in economic modelling. Particularly, 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 but 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 possibly 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,
- practicing to solve the home work in due time,
- 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 possibly to present own problem solutions,

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.

Media
downloadable from IT server

Basic literature
- Pindyck, Robert S./Rubinfeld, Daniel L., Mikroökonomie, 6. Aufl., Pearson. Münšchen, 2005

Complementary literature
- Offer for interested and top students: detailed top articles with proofs, algorithms, ... state-of-the-art surveys, industrial magazines and scientific journals, pointers to recent developments related to the course.
- Tutorials and perhaps simpler literature alternatives for students to fill in gaps in prerequisites (or to fresh up their memory). Alternatives with a different mode of explanation to help students understand ...
Course: Statistics I

Lecturers: Markus Höchstötter
Credit points (CP): 5
Hours per week: 4/0/2
Term: Sommersemester
Level: 1
Teaching language: Deutsch
Part of the modules: Statistics [IW1WWSTAT] (S. 22)

Learning Control / Examinations
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.

Conditions
None.

Learning Outcomes
The Student should understand and apply
• 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

Media
lecture notes

Basic literature
Skriptum: Kurzfassung Statistik I

Complementary literature
• Bol, G.: Deskriptive Statistik, 5. Aufl., Oldenbourg, München etc., 2001
• Bosch, K.: Statistik-Taschenbuch, Oldenbourg, München etc., 1992
Course: Statistics II

Lecturers: Markus Höchstötter
Credit points (CP): 5  
Hours per week: 4/0/2
Term: Wintersemester  
Level: 2
Teaching language: Deutsch
Part of the modules: Statistics [IW1WWSTAT] (S. 22)

Learning Control / Examinations
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
It ist recommended to attend the course Statistics I [25008/25009] before the course Statistics II [25020/25021].

Conditions
None.

Learning Outcomes
probability theory (continued), Introduction to estimation and testing theory

Content
B. Probability Theory: transformation of probabilities, parameters of location and dispersion, most important discrete and continuous distributions, covariance and correlation, convolution and limit distributions
C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method ), internal estimations, theory of tests (optimality, most important examples of tests)

Media
lecture notes

Basic literature
Script: Kurzfassung Statistik II

Complementary literature
• Bohley, P.: Statistik, 5. Aufl., Oldenbourg, München etc., 1992
• Bol, G.: Induktive Statistik, 3. Aufl., Oldenbourg, München etc., 2003
• Bosch, K.: Statistik-Taschenbuch, Oldenbourg, München etc., 1992
• Büning, H. - Trenkler, G.: Nichtparametrische statistische Methoden, de Gruyter, Berlin, 1994
Course: Civil Law for Beginners

Lecturers: Thomas Dreier, Peter Sester
Credit points (CP): 4  Hours per week: 4/0
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
The assessment consists of a written exam (90 min) according to Section 4, (2), 1 of the examination regulation.

Prerequisites
None.

Conditions
None.

Learning Outcomes
To begin with, the course provides students with a general introduction into law. It shall enable them to understand legal problems and solutions both with regard to lawmaking and to individual cases. Students shall grasp the differences between civil law, public law and criminal law. In particular, students shall learn the fundamental notions and constructions of Civil law as laid down in the German Civil Code (Bürgerliches Gesetzbuch, BGB), such as subjects and objects of law, legally binding declarations, the formation of contracts, standard terms and conditions, consumer protection, performance of contractual promises etc. Students shall be trained to understand legal problems and legal solutions. They shall be able to recognise the legal problems of a given factual situation and develop solutions to simple legal problems.

Content
The course starts with a general introduction into law. What is law, why are legal rules valid, and what is the role of law in conjunction with social behaviour, technological and market developments? What is the relationship between law and justice? Moreover, the distinction between civil law, public law and criminal law will be highlighted. The basics of jurisdiction, international conflicts and alternative dispute settlement will be discussed. The main focus of the course is on the fundamental notions of civil law as defined and regulated in the German Civil Code (Bürgerliches Gesetzbuch, BGB), such as subjects and objects of law, legally binding declarations, agency, the formation of contracts, standard terms and conditions, consumer protection, performance of contractual promises. The course ends with an outlook to the law of contracts and property law.

Media
Transparencies/Slides

Basic literature
Tba at the beginning of the course,

Complementary literature
Tba at the beginning of the course,
Course: Advanced Civil Law

Lecturers: Thomas Dreier, Peter Sester
Credit points (CP): 3  Hours per week: 2/0
Term: Sommersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
Assessment will consist of written exams within Privatrechtliche Übung following §4, Abs. 2, 3 of the examination regulation.

Prerequisites
The course Civil law for beginners [24012] is required.

Conditions
None.

Learning Outcomes
Following what the students have learned in the course Civil law for beginners about the basic notions of law and, in particular, the general part of the German Civil Code (Bürgerliches Gesetzbuch, BGB), in this course the students shall acquire knowledge of contract and of property law. They will learn about the statutory regulation of place, time and modalities of the performance of contractual duties, as well as the statutory rules governing defaults of performing contractual promises (impossibility of performance; non-performance; delayed performance, defective performance). In addition the students will be presented with the different types of contracts and with both liability for fault and strict liability. As far as property law is concerned, the students shall understand the different types of transfer of ownership and of securities the German Civil Code provides for.

Content
Following what the students have learned in the course Civil law for beginners about the basic notions of law and, in particular, the general part of the German Civil Code (Bürgerliches Gesetzbuch, BGB), in this course the students shall acquire knowledge of contract and of property law. On the one hand, this includes the statutory rules on place, time and modalities of performance, and the statutory rules governing defaults of performing contractual promises (impossibility of performance; non-performance; delayed performance, defective performance). On the other hand, the statutory types of contracts will be discussed (in particular, sale, lease, contract for work and contract for services, lending and borrowing) as well as new types of combined contracts (e.g., leasing, factoring, computer contracts). Moreover, legal liability will be discussed both with regard to liability for fault and with regard to strict liability. As regards property law, possession and ownership will be discussed as well as the different forms of transfer of ownership and the most important of the security rights.

Media
Transparencies/Slides

Basic literature
Tba at the beginning of the course.

Complementary literature
Tba at the beginning of the course
Course: Commercial and Corporate Law

Lecturers: Peter Sester
Credit points (CP): 3  Hours per week: 2/0
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
Assessment will consist of written exams following §4, Abs. 2, 3 of the examination regulation.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Media
Folien

Basic literature
Klunzinger, Eugen

Complementary literature
tba in Vorlesungsfolien
Course: Exercises in Civil Law

Lecturers: Peter Sester, Thomas Dreier
Credit points (CP): 3  
Hours per week: 2/0
Term: Winter-/Sommersemester  
Level: 1
Teaching language: Deutsch

Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
Assessment will consist of five written exams following §4, Abs. 2, 3 of the SPO. At least two exams have to be passed, to pass the course. The final grade is calculated as the median of the two exams that have been passed with the best grades.

Prerequisites
Students must have attended the course Civil Law for Beginners [24012] or a comparable introduction into (German) civil law. It is highly recommended that students have likewise attended the courses Advanced Civil Law [24504] and Commercial and Corporation Law [24011].

Conditions
None.

Learning Outcomes
It is the aim of this course to enable students to solve legal cases by way of the appropriate legal technique (so-called Subsumtion). At the same time, the legal knowledge which students have acquired in the courses “Civil Law for Beginners”, “Advanced Civil Law” and “Commercial and Corporation Law” will be repeated and deepened. This shall enable students to solve practical legal problems in a methodologically correct way.

Content
In 5 sessions the substantive law which students have been taught in the courses “Civil Law for Beginners”, “Advanced Civil Law” and “Commercial and Corporation Law” will be repeated and the method for solving legal cases deepend. Moreover, 5 sessions are reserved to written exam problems which cover the totality of what students have learned so far. Additional sessions are reserved for the subsequent in-class discussion of the exam problems.

Media
Slides

Basic literature
tba in the course.
Course: Public Law I - Basic Principles

Lecturers: Indra Spiecker genannt Döhmann
Credit points (CP): 3  Hours per week: 2/0
Term: Wintersemester  Level: 2
Teaching language: Deutsch
Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
The assessment consists of a written exam concerning the courses Public Law I [24016] and Public Law II [24520] (according to Section 4(2), 1 of the examination regulation).

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content
The course covers core material of constitutional and administrative law. It begins with the differentiation between public and private law. In the constitutional law part, the course will concentrate on the rule of law and individual rights, especially those protecting communication and entrepreneurship. The administrative law part will explain the different legal instruments of the administration how to act (rule, order, contract, etc.) and their propositions. Also, court proceedings to sue the administrative will be discussed. Students will learn the technique how to solve (easy) administrative and constitutional cases.

Media
abstracts, sketches on blackboard, slides

Basic literature
tba in scriptum

Complementary literature
tba in scriptum

Remarks
From the winter term 2008 on, the Public Law I will be lectured during the winter term and Public Law II will be lectured during the summer term. This means:

1. In the winter term 2008/2009, Public Law I was being lectured.
2. In the summer term 2009, Public Law II will be lectured.
Course: Public Law II - Public Economic Law

Lecturers: Indra Spiecker genannt Döhmann
Credit points (CP): 3    Hours per week: 2/0
Term: Sommersemester    Level: 2
Teaching language: Deutsch
Part of the modules: Business and Public Law [IW1INJURA] (S. 23)

Learning Control / Examinations
The assessment consists of a written exam concerning the courses Public Law I \([24016]\) and Public Law II \([24520]\) according to Section 4(2), 1 of the examination regulation.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Public economic law is of significant importance to supervise the German economy. In order to understand the functionality of mandatory interventions into market mechanisms in a thoroughly normed legal system, appropriate legal knowledge is required. This knowledge is to be provided in the lecture. In doing so, substantive law ought to be dealt with in a deepened way, while responsible authorities and institutions as well as possibilities of legal protection in the area of public commercial law will be taught at a glance. The lecture’s primary aim is to exercise handling the corresponding legal norms. It proceeds the lecture Public law I.

Content
In a first step legal basics of the economic system (such as financial system and freedom of property and profession) will be presented. In this context, interaction between the Basic Constitutional Law and presettings of European Community law will be elaborated on as well. Thereafter, regulatory instruments of the administrative law will be analysed extensively. As particular matters, we will deal with industrial code, further trade law (handicrafts code; law of gastronomy), basic principles of telecommunication law, state aid law and public procurement law. A last part is devoted to the institutional design of the economy’s regulation.

Media
content structure; documents

Basic literature
Will be announced in the lecture.

Complementary literature
tba in lecture slides

Remarks
In winter term 2008 on, the Public Law I will be lectured during the winter term and Public Law II will be lectured during the summer term. This means:

1. In the winter term 2008/2009, Public Law I will be lectured.
2. In the summer term 2009, Public Law II will be lectured.
Course: Mathematics I for Information Engineering and Management  Course key: [01360]

Lecturers: Andreas Rieder, Christian Wieners, Nicolas Neuss
Credit points (CP): 7.5  Hours per week: 4/2/2
Term: Wintersemester  Level: 1
Teaching language: Deutsch
Part of the modules: Mathematics [IW1MAMATH] (S. 24)

Learning Control / Examinations
Assessment will consist of a written exam following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft and a marked proof of attendance as result checking following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The aim of the course “Mathematics I” is to impart a comprehension of basic methods in linear algebra.

Content
The two lectures „Mathematics I and II for the subject area Information Systems“, edoate basic mathematical knowlegde which is required to understand modern computer science and economical sciences. Part I is concerned with linear algebra including the basic algebraic structures, vector spaces and linear mappings. These structures are important for example in computer science.

Media
blackboard, data projector and transparencies if necessary

Basic literature
None.

Complementary literature
• Offer for interested and top students
  Ammann / Escher: Analysis I–III, Birkhäuser
• Tutorials / simpler literature alternatives
  Henze / Last: Mathematik für Wirtschaftsingenieure I–II, Teubner
  Ansorge / Oberle: Mathematik für Ingenieure I–III, Wiley
Course: Mathematics II for Information Engineering and Management  
Course key: [01877] 

Lecturers: Andreas Rieder, Christian Wieners, Nicolas Neuss  
Credit points (CP): 7,5  
Hours per week: 4/2/2  
Term: Sommersemester  
Level: 1  
Teaching language: Deutsch  
Part of the modules: Mathematics [IW1MAMATH] (S. 24)  

Learning Control / Examinations  
Assessment will consist of a written exam following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft and a marked proof of attendance as result checking following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft.  

Prerequisites  
Mathematics I  

Conditions  
None.  

Learning Outcomes  
The aim of the course “Mathematics I” is to impart a comprehension of basic methods in analysis.  

Content  
The lectures in mathematics give an overview in basic mathematical knowledge which is required to understand modern computer science and economical sciences. Part II consists of analysis including an introduction into the calculus of functions of one or several variables.  

Media  
blackboard, data projector and transparencies if necessary  

Basic literature  
none  

Complementary literature  
• Offer for interested and top students  
  Ammann / Escher: Analysis I–III, Birkhäuser  
• Tutorials / simpler literature alternatives  
  Henze / Last: Mathematik für Wirtschaftsingenieure I–II, Teubner  
  Ansorge / Oberle: Mathematik für Ingenieure I–III, Wiley
7.2 Courses of term 5-6

Course: Logistics

Course key: [21078]

Lecturers: Kai Furmans
Credit points (CP): 6  Hours per week: 3/1
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35), Supply Chain Management [IW3WWEBM1] (S. 37)

Learning Control / Examinations
The assessment consists of a written exam according to Section 4 (2), 1 of the examination regulation. The grade of the exam may be improved by passing exercises.

Prerequisites
Required are lectures on “Linear Algebra” and “Stochastic”.

Conditions
None.

Learning Outcomes
After successfully finishing this course, the student is able to plan simple material handling and logistic systems and is able to assign the right models to a certain task. He is able to evaluate the performance of the most important elements of material handling and logistic systems.

Content
Introduction
- historical overview
- lines of development

Structure of logistics systems

Distribution logistics
- location planning
- Vehicle Routing Planning
- distribution centers

Inventory management
- demand forecasting
- Inventory management policies
- Bullwhip effect

Production logistics
- layout planning
- material handling
- flow control

Supply Management
- information flow
- transportation organization
- controlling and development of a logistics system
- co-operation mechanisms
- Lean SCM
- SCOR model

Identification Technologies

Media
Blackboard, Beramer, In Excercises also PCs

Complementary literature
- Domschke. Logistik, Rundreisen und Touren, Oldenbourg Verlag, 1982
- Domschke/Drexl. Logistik, Standorte, Oldenbourg Verlag, 1996
- Gudehus. Logistik, Springer Verlag, 2007
- Tempelmeier. Bestandsmanagement in Supply Chains, Books on Demand 2006
Course: Data Protection Law

**Lecturers:** Indra Spiecker genannt Döhmann

**Credit points (CP):** 3  **Hours per week:** 2/0

**Term:** Wintersemester  **Level:** 4

**Teaching language:** Deutsch

**Part of the modules:** Intellectual Property and Data Protection Law [IW3INJURA] (S. 49)

**Learning Control / Examinations**
Assessment will consist of a written exam (following §4(2), 1 SPO).

**Prerequisites**
None.

**Conditions**
None.

**Learning Outcomes**
Increasing significance of information technology for data processing and interconnectedness of the society by means of telecommunication does not only enhance the social and economical relevance of data in general, it raises the question about legal rules for the protection of personalised data as well. The problem for those who are responsible for the application of law is that national rules in this area are in constant flux due to technological progress and Europeanisation of law. Additionally there is a vast number of sector-specific regulation (such as labour law). Bearing all this in mind, the lecture’s main focus is the presentation of the basic principles of the German Federal Act on Data Protection (Bundesdatenschutzgesetz). In doing so, new concepts of data protection like self-data protection or system data protection will be analysed. A further focal point is the examination of evolution of sector-specific data protection law, considering as example regulation of data protection in connection with teleservice or mediaservice. Students should learn how to negotiate their ways in the interaction of different levels of legal norms and solve simple problems of data protection law.

**Content**
After illustrating contents and history of data protection law there will be presented backgrounds with respect to Community law and under constitutional law. Further on, the German Federal Act on Data Protection will be focussed. At this will be set forth basic principles of regulation (such as necessity), personalised data as an object of regulation, rights of those who are affected as well as the legitimacy of different procedures of data processing. Organisational regulations, particularly data security official will be approached as well. Further on, in a case study current concepts of data protection and the problem of video surveillance will be discussed. Finally, there are three units on sector-specific regulation of telecommunication and teleservice / mediaservice.

**Media**
abstracts, sketches on blackboard, slides

**Basic literature**
Will be announced in the course.

**Complementary literature**
Will be announced in the course.

**Remarks**
In cooperation with the House of Competence, Students should be rhetorical trained asking and answering questions (short-answer-and-question-technique). Therefor most likely a coach will attend several lessons.
Course: Industrial Property and Copyright Law

Lecturers: Thomas Dreier
Credit points (CP): 3  Hours per week: 2/0
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Intellectual Property and Data Protection Law [IW3INJURA] (S. 49)

Learning Control / Examinations
Assessment will consist of a written exam (§4, Abs. 2, 1 of the SPO).

Prerequisites
None.

Conditions
None.

Learning Outcomes
It is the aim of this course to give students an overview of the law of intellectual property. The course focuses on patent law, trademark law, copyright law and also presents other laws of industrial property, including the additional legal protection by unfair competition law. Students shall understand the differences between registration and non-registration rights. Key concepts such as territoriality, conditions for protection, exclusive rights, limitations and exceptions, infringement and sanctions will be discussed. In addition, the focus will be on licensing of IP rights. The course covers national, european and international IP law.

Content
The course gives an introduction in to the legal protection of intellectual property. The different rationals for granting legal protection to immaterial goods will be explained, as well as the difference between registration and non-registration rights, and the system of international IP protection on the basis of the principle of territoriality will be explained. Following, the different IP rights will be discussed with regard to their respective conditions and scope of protection. An overview of licensing and of the sanctions in case of infringement of IP rights will be given.

Media
Slides.

Basic literature
Ilzhöfer, Volker Patent-, Marken- und Urheberrecht Verlag Vahlen, 7current edition

Complementary literature
Additional literature tba
Course: Public Key Cryptography

Lecturers: Willi Geiselmann
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26), Information Services in Networks [IW3INIDL0] (S. 29)

Learning Control / Examinations
The assessment will consist of a written 1 hour exam according to § 4 Abs. 2 Nr. 1 SPO.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The student gets acquainted with practical methods and mechanisms of IT-security, as well as with the theoretical background of IT-security.

Content
First, the basic concepts of cryptography are presented, e.g. one-way function, hash function, and digital signatures. Then some of the most important cryptographic algorithms will be discussed, pointing out its strengths and weaknesses. In particular, public-key encryption, digital signatures (RSA, ElGamal, Knapsack and McEliece), and key exchange (Diffie-Hellman) will be presented. The security of public-key systems, is based almost exclusively on number theoretical problems like prime tests, factoring large numbers and calculate discrete logarithms in finite groups. To understand the choice of parameters of cryptographic systems and to evaluate the security of them, some of the algorithms for solving these number theoretical problems are presented. Finally, current protocols such as Secure Shell (SSH), Transport Layer Security (TLS) and anonymous digital cash will be discussed. These protocols make use of the basic cryptographic algorithms to solve tasks such as authentication and key exchange.

Media
lecture notes

Basic literature
- lecture notes, available at http://iaks-www.ira.uka.de/lehre/pubkey/index.html (username and password will be announced in the lecture)

Complementary literature
Course: Vernetzte IT-Infrastrukturen

Lecturers: Wilfried Juling  
Credit points (CP): 5  
Hours per week: 2/1  
Term: Wintersemester  
Level: 4  
Teaching language: Deutsch  
Part of the modules: Algorithm Design [IW3INALG0] (S. 26), Information Services in Networks [IW3INIDLO] (S. 29)

Learning Control / Examinations
A written exam of 60 minutes, according to §4 Abs. 2 Nr. 1 SPO.

Prerequisites
None.

Conditions
Dependencies according to the module.

Learning Outcomes
Goal of this lecture is to introduce the basic descriptions and methodologies of computer networks.

Content
The lecture introduces formal methods to describe communication in general. After a brief discussion covering the basics of signal processing as well as physical constraints of telecommunication technologies, the lecture follows the architectural pattern of the OSI Reference Model to point out its given systematics. Based on elementary network technologies like Ethernet and Token Ring the lecture outlines essential problems concerned with frame alignment, shared or controled medium access or error processing. Further topics deal with the realization of worldwide networks regarding protocols, technologies and algorithms used to construct them. Particularly, technical solutions and algorithms from the TCP/IP stack of the Internet Reference Model are discussed. Furthermore, the functionality and application scope of modern components to interconnect heterogenous networks are presented. Finally dedicated communication technologies like ISDN and higher level application protocols like HTTP or SMTP are introduced to indicate the pervasion of network communication technologies towards people.

Media
Slides

Basic literature

Complementary literature
Course: Algorithm Design

Course key: [24079]

Lecturers: Dorothea Wagner, Peter Sanders
Credit points (CP): 6 Hours per week: 3/1
Term: Wintersemester Level: 4
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26)

Learning Control / Examinations
Assessment will consist of a written exam (1h) according to § 4 Abs. 2 Nr. 1 SPO.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The students
- get a deep insight into the most important subareas of algorithmics,
- get a broad algorithmic understanding,
- get the ability to understand and determine the running times of algorithms,
- get the knowledge of fundamental algorithms and data structures, as well as the ability to apply them to new problems.

Content
The Lecture “Algorithm Design” (german name is “Algorithmentechnik”) deepens the most important subareas of algorithmics. This, for example, includes graph algorithms, advanced data structures, design principles for algorithms, algorithmic geometry, and combinatorial optimization. Moreover, different methodic approaches are deepened. For Example, randomized algorithms, approximation algorithms, parallel algorithms, online algorithms, and algorithm engineering.

Basic literature
None

Complementary literature
Course: Practical Course in Algorithm Design

Lecturers: Peter Sanders, Dorothea Wagner, Marcus Krug
Credit points (CP): 5  Hours per week: 4
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26)

Learning Control / Examinations

Prerequisites
Lecture Algorithmentechnik

Conditions
None.

Learning Outcomes
The purpose of the practical course in algorithm design is to make learned knowledge work. The students are given varying topics from algorithmics, which they have to implement in small working groups. Possible Topics are, for example, algorithms for flow problems, shortest path problems, or clustering techniques. In this way students learn to write efficient code.

Content
In the practical course Algorithm Engineering the students are given miscellaneous questions from algorithmics, which they have to implement independently in small working groups. The main focus lies on object oriented programming with Java or C++. Linear programming may also occur.
Course: Seminar in Algorithm Design

Lecturers: Dorothea Wagner
Credit points (CP): 3  Hours per week: 2
Term: Winter-/Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26)

Learning Control / Examinations
Assessment will consist a written elaboration of the performed task and an oral presentation thereof following §4, Abs. 2, 3 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Students shall
• conduct literature research starting from a given topic, identify, locate, evaluate and summarize relevant literature.
• compose their written elaboration (and later their bachelor/masters thesis) with a minimum of introductory effort, and thereby respect given templates similar to those enforced in standard scientific publication processes.
• devise a presentation in the context of the scientific topic. To this end, techniques are presented that enable the processing and the presentation of content in a way suitable for the audience.
• present their research results in a written form similar to standard scientific dissemination.

Content
Various current topics that build upon the contents of the associated lectures.
Course: Workflowmanagement-Systems

Lecturers: Jutta Mülle
Credit points (CP): 3  Hours per week: 2
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
It will be announced in advance if the assessment consists of an 1h written exam following §4, Abs. 2, 1 of the Prüfungsordnung or of a 20 minute oral examination following §4, Abs. 2, 2 of the Prüfungsordnung.

Prerequisites
Knowledge about database systems, e.g. from the lecture Communications and Database Systems [24574].

Conditions
None.

Learning Outcomes
A goal of the course is that the participants are able to model workflows, to explain modelling aspects and their relationships, to compare modelling methods, and to evaluate the usability of these methods in different application areas. They should understand the technical construction of workflow-management systems with the most important components and different architectures and implementation alternatives. Finally, the participants should have obtained an overview on actual relevant standardization proposals and how to use these approaches, and they should be aware of actual research topics.

Content
Workflow Management Systems (WFMS) support the management of business processes according to pre-defined process descriptions. Managing processes flexibly, i.e., handle deviations, e.g., in order to catch exceptions, adapt processes to modified process environments or to support ad-hoc workflows, becomes more and more important.

The course starts with discussing WFMS in the context of business-information systems and their relationship with the more common business-process modelling. Petri nets and pi-calculus are introduced as basic formalisms. Then, methods to model workflows and the design process for workflow-management applications are presented in detail and supplemented with exercises.

An advanced aspect is new research in WFMS technology. In particular, the use of internet techniques like web services and standardization approaches for process modeling, orchestration, and choreography in service-oriented architectures will be presented.

In the realization part of the course, various implementation techniques and architectural issues to realize workflow-management systems as well as diverse system types and concrete workflow-management systems are presented.

Media
Slides.

Basic literature
• W.M.P. van der Aalst: Workflow Management: Models, Methods, and Systems. MIT Press, 368 pp., 2002

Complementary literature
Course: Data Warehousing and Mining

Course key: [24118]

Lecturers: Klemens Böhm
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
It will be announced in advance if the assessment consists of an 1h written exam following §4, Abs. 1 of the Prüfungsordnung or of a 20 minute oral examination following §4, Abs. 2 of the Prüfungsordnung.

Prerequisites
Knowledge about database systems, e.g. from the lecture Communications and Database Systems [24574].

Conditions
None.

Learning Outcomes
At the end of the lecture, the participants should be aware of – and able to explain – the necessity of data warehousing and of data mining concepts. They should be able to assess and compare different approaches of management and analysis of large datasets with respect to efficiency and applicability. The participants should have gained an insight into the current research issues in the area of data warehousing and data mining and should understand which problems are currently unsolved.

Content
Data warehouses and data mining raise much interest from practitioners with huge amounts of data, e.g., in retail, finance and the insurance sector. Both warehousing and mining are motivated by the desire for keeping track of large and possibly distributed datasets and for extracting interesting relations from such data, ideally with minimal effort. A data warehouse is a repository which is fed with data from one or more operational database systems. The data is preprocessed allowing for a fast evaluation of complex analytical queries (OLAP, Online Analytical Processing). In contrary, data mining provides techniques for discovering patterns in large datasets.

Media
Slides.

Basic literature
- Jiawei Han, Micheline Kamber: Data Mining: Concepts and Techniques. 2nd edition, Morgan Kaufmann Publishers, March 2006.

Complementary literature
Further literature will be mentioned at the end of each chapter in the lecture slides.
Course: Web Engineering

Lecturers: Martin Nußbaumer
Credit points (CP): 4
Hours per week: 2/0
Term: Wintersemester
Level: 4
Teaching language: Deutsch
Part of the modules: Information Services in Networks [IW3INIDLo] (S. 29)

Learning Control / Examinations
Assessment will consist of an oral exam (20 min) following §4, Abs. 2, 1 of the SPO.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The goal of this course is to introduce the foundations, the methods and the techniques of web engineering. After this course, students have gained knowledge and insights of existing methods, technologies and system approaches and are enabled to design and evaluate such web-based systems.

Content
This course is designed as an introduction to the discipline of Web Engineering. This course will discuss the systematic production of Web-based applications and systems by focusing on the different phases and aspects of the Web application lifecycle. It will help you look at Web application phenomena, requirements, Web design and architecture, development and management from different perspectives - as Web designer, analyst, architect, component engineer, program manager, product manager or CIO for example. You will learn how to produce Web applications and agile systems from requirements engineering, concept, design, development, testing, deployment and up to operation, marketing, and evolution. Many examples will be shown and discussed - showing the need for expecting change and staying agile. This is not a programming course, you will only be introduced to the core technology aspects and are encouraged to consolidate the details.

Media
Slides

Basic literature
Course: Network and IT-Security Management

Course key: [24149]

Lecturers: Hannes Hartenstein
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Information Services in Networks [IW3INIDL0] (S. 29)

Learning Control / Examinations
Oral exam of 30 minutes, according to §4 Abs. 2 Nr. 2 of the SPO.

Prerequisites
Basics in computer networks, according to the lectures Kommunikation und Datenhaltung [24574] and Vernetzte IT-Infrastrukturen [24074] respectively are required.

Conditions
Dependencies according to the module description.

Learning Outcomes
The goal of this lecture is to introduce the basics of network and IT-security management. Technical as well as underlying management concepts should are described.

Content
The lecture covers architectures, models, protocols and tools for controlling and monitoring of heterogeneous networks. Additionally, issues related to security and reliability are also covered. The lecture presents technical solutions as well as corresponding management concepts. The first part of the lecture introduces management architecture in particular the Internet management architecture based on the SNMP protocol. Afterwards corresponding tools, platforms, and operational implementations are presented. Furthermore public IP coordination and current trends are described. In the IT-Security management part of the lecture the concept of a security process is introduced based on the BSI Grundschutz. Additional topics are access and identity management as well as firewalls, intrusion detection and prevention. Besides theoretical method and concepts, practical examples are shown.

Media
Slides

Basic literature

Complementary literature
Course: Randomized Algorithms

Lecturers: Thomas Worsch

Credit points (CP): 4  Hours per week: 2

Term: Wintersemester  Level: 4

Teaching language: Deutsch

Part of the modules: Algorithm Design [IW3INALG0] (S. 26)

Learning Control / Examinations
Assessment will consist of an oral exam (20 min) following §4, Abs. 2, 2 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Students become acquainted with the basic important approaches to and techniques for applying randomization in algorithms and the tools for their analysis.

Students are able to identify and assess typical weak points in deterministic algorithms and to develop randomized alternatives to eliminate them.

Content
Randomized algorithms are not deterministic. Their behavior depends on the outcome of random experiments. This idea first became generally known due to Rabin's randomized primality test. Meanwhile randomized algorithms have been developed for quite a number of problems, and often they are faster (in one sense or another). Furthermore randomized algorithms sometimes are easier to understand and to implement than deterministic algorithms.

In the course not only different types of randomized algorithms (Las Vegas, Monte Carlo, ...) are present. In addition foundations and tools from probability theory are introduced as far as they are necessary for the analysis of the algorithms, and attention is given to further important concepts like Markov chains. Since stochastic methods are of importance in more and more fields in informatics, the usefulness of the course extends beyond the scope of randomized algorithms.

Contents:
- probabilistic complexity classes
- routing in hypercubes
- game theory
- random walks
- randomized graph algorithms
- randomized hashing
- randomized online algorithms

Media
lecture notes and slides in pdf format;

Basic literature
- J. Hromkovic : Randomisierte Algorithmen, Teubner, 2004

Complementary literature
Course: Europäische Entwicklungen im Informationsrecht  

Course key: [24350]

Lecturers: Ulf Brühann
Credit points (CP): 4  
Hours per week: 2/0
Term: Winter-/Sommersemester  
Level: 4
Teaching language: Deutsch
Part of the modules: Intellectual Property and Data Protection Law [IW3INJURA] (S. 49)

Learning Control / Examinations
Prerequisites
None.
Conditions
None.
Learning Outcomes
Content
Course: Software Engineering I

Lecturers: Walter F. Tichy, Höfer, Meder
Credit points (CP): 6
Hours per week: 3/1/2
Term: Sommersemester
Level: 1
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26), Design and Implementation of Complex Systems [IW3INCS0] (S. 27), Business Process Engineering [IW3INGP0] (S. 28), Information Services in Networks [IW3INIDL0] (S. 29)

Learning Control / Examinations
The assessment will consist of a 60 minute written exam according to § 4 Abs. 2 Nr. 1 SPO.
The grade of the module is the grade of the written exam.

Prerequisites
The passing of the module Informatik I is obligatory.

Conditions
None.

Learning Outcomes

Content

Media
slides, tutorial papers

Basic literature
None.

Complementary literature
  (International computer science series), ISBN 0-321-21026-3
- Design Patterns: Elements of Reusable Object-Oriented Software / Gamma, Erich and Helm, Richard and Johnson, Ralph and Vlissides, John, Addison-Wesley 2002
- C# 3.0 design patterns : [Up-to-date for C#3.0] / Judith Bishop Beijing ; Köln [u.a.] : O’Reilly, 2008. - XXI, 290 S.
Course: Communication and Database Systems

Lecturers: Klemens Böhm, Martina Zitterbart

Credit points (CP): 4/8  Hours per week: 4/2

Term: Sommersemester  Level: 4

Teaching language: Deutsch

Part of the modules: Algorithm Design [IW3INALG0] (S. 26), Design and Implementation of Complex Systems [IW3INCS0] (S. 27), Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations

Prerequisites
None.

Conditions
Lectures about system architecture and software engineering are recommended but not mandatory.

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

Media
Slides.

Basic literature
• Andreas Heuer, Kai-Uwe Sattler, Gunther Saake: Datenbanken — Konzepte und Sprachen, 3. Aufl., mitp-Verlag, Bonn, 2007
• Alfons Kemper, André Eickler: Datenbanksysteme. Eine Einführung, 6. Aufl., Oldenbourg Verlag, 2006

Complementary literature
Course: The Digital Library

Lecturers: Christoph-Hubert Schütte
Credit points (CP): 3  Hours per week: 2
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
Assessment will consist of an oral exam (20 min) following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The overall aim of the lecture is to develop an awareness of the problems involved in organising information, for individual scientists as well for institutions like libraries. The participants should be able to comprehend the development of methods of resolution in these particular fields and about the state of the art regarding research in the field of information science.

Content
The lecture The Digital Library gives an insight into modern methods of information supply for research, teaching, studies and job. The lecture shows the changes of the information structures and services on their way to a digital library. One part of the lecture is an insight into the work of the department of media and the department of document delivery for print and non-print media of the University Library. The lecture further shows how those media are indexed. The focus lays on the automation of the processes. The usage of information databases and the potentialities of Multimedia are very intensely discussed. The lecture shows the actual change in the field of information services, it presents new services and gives an insight into the actual research work of the University Library in cooperation with the faculties of the University.

Media
Slides.

Basic literature
None.

Complementary literature
Relevant publications will be mentioned in the lecture.
Course: Component Based Software Engineering

Lecturers: Ralf Reussner, Michael Kuperberg, Klaus Krogmann
Credit points (CP): 3  Hours per week: 2
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Design and Implementation of Complex Systems [IW3INCS0] (S. 27)

Learning Control / Examinations
Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Basic literature
- F. Griffel, Componentware, dPunkt Verlag, 1998
Course: Economics III: Introduction in Econometrics

Lecturers: Markus Höchstötter
Credit points (CP): 5   Hours per week: 2/2
Term: Sommersemester   Level: 3
Teaching language: Deutsch
Part of the modules: Applied Finance [IW3WFIN0] (S. 39)

Learning Control / Examinations
The assessment consists of an 1h written exam according to Section 4(2), 1 of the examination regulation.

Prerequisites
statistics I + II

Conditions
None.

Learning Outcomes
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)
Multi equation models
Dynamic models

Basic literature
• Goldberger: A course in Econometrics ISBN 0-674-17544-1
• Gujarati: Basic Econometrics ISBN 0-07-113964-8
• Schneeweß: Ökonometrie ISBN 3-7908-0008-2

Complementary literature
Additional literature will be suggested in course
Course: Marketing and Consumer Behavior

Course key: [25150]

Lecturers: Wolfgang Gaul
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Foundations of Marketing [IW3WMAR1] (S. 44)

Learning Control / Examinations

Prerequisites
See corresponding module description.

Conditions
See corresponding module description.

Learning Outcomes

Content
Starting from the S-O-R paradigm where S stands for “stimuli”, O for “organism”, and R for “reactions”, aspects of consumer behavior are explained and possibilities are provided how marketing activities can be used to create desired influences. S-R models describe how consumer reactions depend on stimuli. Cognitive processes and psychical states help to explain how the (unobservable) interior of the organism contributes to the interpretation of reactions. In this context the adequate combination of available marketing instruments (price, product, promotion, place) will be discussed.

Basic literature
Further literature references are announced in the script.
Course: Modern Market Research

Lecturers: Wolfgang Gaul
Credit points (CP): 5  Hours per week: 2/1
Term: Sommernsemester  Level: 4
Teaching language: Deutsch
Part of the modules: Foundations of Marketing [IW3WWMAR1] (S. 44)

Learning Control / Examinations
See module description.

Prerequisites
Basic knowledge of statistics.

Conditions
None.

Learning Outcomes

Content

Basic literature
Further literature references are announced in the script.
Course: Marketing and Operations Research

Course key: [25156]

Lecturers: Wolfgang Gaul
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Foundations of Marketing [IW3WWMAR1] (S. 44)

Learning Control / Examinations
See module description.

Prerequisites
Basics of Operations Research are required.

Conditions
None.

Learning Outcomes

Content

Basic literature
Will be announced in the lecture. Further literature references are announced in the script.
Course: Corporate Planning and Operations Research

Lecturers: Wolfgang Gaul
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Analytical CRM [IW3WWCRM1] (S. 32), Operative CRM [IW3WWCRM2] (S. 33)

Learning Control / Examinations

Prerequisites
Basics of operations research are assumed.

Conditions
None.

Learning Outcomes

Content

Basic literature
Will be announced in the lecture. Further literature references are announced in the script.
Course: Brand Management

Lecturers: Bruno Neibecker
Credit points (CP): 4  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Foundations of Marketing [IW3WWMAR1] (S. 44)

Learning Control / Examinations
Examination performance will consist of a written exam according to §4 Abs. 2, Nr. 1 of the “Prüfungsordnung für Informationswirtschaft” within the module of “Grundlagen des Marketing”. (IW3WWMAR1).

Prerequisites
None.

Conditions
None.

Learning Outcomes
(See description of the module)

Content
The students should learn the essential scientific and practical principles of Marketing, especially branding. Branding consists of any name, design, style, words or symbols, singly or in any combination that distinguish one product from another in the eyes of the consumer. Brand positioning, brand loyalty and brand equity are discussed as important elements of a management concept. The focus of the course is not limited to short-term ROI, but also long-term benefits of communication strategies facing company’s responsibilities to all of its stakeholders, e.g. consumers, investors and public. The strategies and techniques in branding are broaden by several case studies. English as an international technical language in marketing is practiced with course readings and scientific papers. Content:
The course brand management starts with the development of the corporate objectives as the heart of the brand planning process followed by definitions of brand. Setting up on the psychological and social bases of consumer behavior, aspects of an integrated marketing communication are discussed. The students should acquire the particular value of branding strategies. The concept of brand personality is considered in two perspectives, from a practical point of view and the challenging position of the theoretical construct. Methods for the measurement of a consumer-based brand equity are compared with the financial valuation of the brand. The information provided by this equity measurements are related to the equity drivers in brand management. The marketers perspective will be accomplish with the analysis of several case studies. Within the limits of a knowledge based system for advertising evaluation many of the issues accomplished in the course are summarized. At the same time it is discussed as a tool to use marketing knowledge systematically.

Media
Slides, Powerpoint presentations, Website with Online Course Readings

Basic literature
Course: Market Microstructure

Lecturers: Torsten Lüdecke
Credit points (CP): 3  Hours per week: 2/0
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: eFinance: Information Engineering and Management in Finance [IW3WEBM2] (S. 38), Financial Markets [IW3WFIN3] (S. 43)

Learning Control / Examinations
Assessment consists of an 1h written exam following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
This lecture makes students familiar with the fundamental models of trading in financial markets. It starts with generic design features of financial markets which are used to frame price discovery as the key element of the trading process. The link between market design and market quality is pointed out by using alternative measures of market quality. Seminal models of market microstructure are used to show how dealer inventory and/or asymmetric information affect market prices and the pricing of securities. Theoretical models are shown to provide predictions which are consistent with empirical evidence.

Content
The focus of this lecture is on the question how the microstructure of financial markets affects price discovery and market quality. First, issues in designing market structure are presented and linked to fundamental dimensions of market quality, i.e. liquidity and trading costs. In particular, the services and privileges of market makers are stressed. The main part of the lecture covers inventory-models of dealer markets and models of information-based trading. The final part gives attention to some econometric models to analyze the short-term behavior of security prices.

Media
Folien.

Basic literature
keine

Complementary literature
See reading list.
Course: Statistics and Econometrics in Business and Economics  

Lecturers: Wolf-Dieter Heller  
Credit points (CP): 5  
Hours per week: 2/2  
Term: Wintersemester  
Level: 3  
Teaching language: Deutsch  
Part of the modules: Applied Finance [IW3WWFIN0] (S. 39)  

Learning Control / Examinations  
The assessment consists of a written exam (30 min) according to Section 4(2),1 of the examination regulation and by a oral exam (20 min) according to Section 4 (2), 2 o the examination regulation.  
The assessment takes place at the beginning of the recess period of the winter semester (or on appointment). Re-examinations are offered at very ordinary examination date.  

Prerequisites  
Basic knowledge in statistics is required.  

Conditions  
None  

Learning Outcomes  
statistically accurate use of financial market data, particularly time series analysis  
Evaluation of various time series models and their applicability  

Content  
In Part 1 we will provide a thorough description of the quantitative part of investment theory paying attention to the mathematical, probabilistic and statistical methods now widely used in financial practice.  
In Part 2 we shall study the methods of construction, identification and verification of the time-series models, which are among most powerful instruments of the financial econometrics. The emphasis will be on the financial and economic indicators forecasting the financial time-series.  

Media  
transparencies lecture  

Basic literature  
e.g.  
• Franke/Härdle/Hafner : Einführung in die Statistik der Finanzmärkte.  
• Ruppert: Statistics and Finance  

Complementary literature  
See reading list
Course: Economics of Uncertainty

Lecturers: Karl-Martin Ehrhart
Credit points (CP): 6  Hours per week: 2/2
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Decision Theory [IW3WWDEC0] (S. 34), Applied Finance [IW3WWFIN0] (S. 39), Financial Economics [IW3WWFIN1] (S. 41)

Learning Control / Examinations
Written exam, possible further requirements.

Prerequisites
See corresponding module information.

Conditions
Knowledge in mathematics and statistics is required.

Learning Outcomes
The student will be made familiar with the basics in modern decision making under uncertainty so that she will be able to analyze concrete decision problems and to develop simple solution procedures. By being confronted with experimental results in decision making the student should also be able to evaluate the behavioral part of decision making.

Content
In the first part of the course we deal with problems of decision making under uncertainty and introduce models like expected utility theory, stochastic dominance, risk aversion, and prospect theory. We also consider the empirical validity of the different approaches.
In the second part the concepts learned in the first part are applied for example to search models and Bayesian games.

Media
overhead slides, possibly additional printed material.

Basic literature

Complementary literature
• Lippman/McCall, Economics of Uncertainty, in: Handbook of Mathematical Economics I, 1986
• DeGroot, Optimal Statistical Decisions, Kap. 1 und 2, 1970
Course: Game Theory II

Lecturers: Siegfried Berninghaus
Credit points (CP): 6  Hours per week: 2/2
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Decision Theory [IW3WWDEC0] (S. 34)

Learning Control / Examinations
Written exam (80 minutes).

Prerequisites
See corresponding module information.
Basic knowledge of mathematics and statistics is assumed.

Conditions
None.

Learning Outcomes
This course teaches advanced knowledge in strategic decision theory. Latest developments in game theory are discussed. The student learns to judge complex strategic problems and to offer adequate solutions.

Content
This lecture aims at amplifying the students’ knowledge in game theory. Main topics are further concepts of non-cooperative game theory, cooperative game theory, evolutionary game theory and bargaining theory.

Media
Folien, Übungsblätter.

Basic literature
• Berninghaus/Ehrhart/Güth, Strategische Spiele, 2. Auflage, Springer Verlag, 2006

Complementary literature
Course: Experimental Economics  

Lecturers: Siegfried Berninghaus, Bleich  
Credit points (CP): 5  
Hours per week: 2/1  
Term: Sommersemester  
Level: 3  
Teaching language: Deutsch  
Part of the modules: Decision Theory [IW3WWDEC0] (S. 34)

Learning Control / Examinations  
The assessment consists of an 80 min written exam. The lecturer may offer the opportunity to reach up to 10 points by writing a seminar thesis and a presentation to an individually announced topic.

Prerequisites  
See corresponding module information.

Conditions  
None.

Learning Outcomes  
The students should learn

• how to gain scientific experience and knowledge (philosophy of science),
• how Game Theory and Experimental Economics influenced each other in scientific research,
• about the methods as well as the strengths and weaknesses of Experimental Economics,
• some examples of experimental research, such as markets and market equilibria, coordination games, bargaining, decision making under risk,
• how to evaluate data.

Content  
Experimental Economics have become a separate field in Economics. Nearly all fields of the economic discipline use economic experiments to verify theoretical results. Besides being used for empirical validation, this method is applied in political and strategic consulting. The lecture gives an introduction to experimental methods in economics and shows differences to experiments in natural sciences. Scientific studies are used to show exemplary applications.

Media  
Classroom experiments or experiments in the computer laboratory will be conducted. To some extent, slides are made available online.

Complementary literature  

• Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.
• Experiments in Economics; J.D. Hey; Blackwell Publishers, 1991.
• Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.
Course: Facility Location and Strategic Supply Chain Management

Lecturers: Stefan Nickel
Credit points (CP): 4.5  Hours per week: 2/1
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Supply Chain Management [IW3WWEBM1] (S. 37)

Learning Control / Examinations
The assessment consist of a written exam (120 min) according to Section 4 (2), 1 of the examination regulation.
The exam takes place in every semester.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The lecture covers basic quantitative methods in location planning in the context of strategic Supply Chain Planning. Besides the discussion of several criteria for the evaluation of the locations of facilities, the students are acquainted with classical location planning models (planar models, network models and discrete models) and advanced location planning models designed for Supply Chain Management (single-period and multi-period models). The exercises accompanying the lecture offer the possibility to apply the considered models to practical problems.

Content
Since the classical work “Theory of the Location of Industries” of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.
Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

Complementary literature
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988

Remarks
The lecture is offered in every summer term.
The planned lectures and courses for the next three years are announced online.
Course: Game Theory I

Lecturers: Siegfried Berninghaus
Credit points (CP): 6  Hours per week: 2/2
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Decision Theory [IW3WWDEC0] (S. 34), Strategy and Managerial Economics [IW3WWORG0] (S. 45), Strategy and Interaction [IW3WWORG1] (S. 46)

Learning Control / Examinations
The assessment consists of a written exam (80 minutes) according to Section 4(2),1 of the examination regulation. The exam takes place in the recess period and can be resited at every ordinary examination date.

Prerequisites
Basic knowledge of mathematics and statistics is assumed.
See corresponding module information.

Conditions
None.

Learning Outcomes
This course conveys established knowledge in theory of strategic decision making. The students shall be able to analyze strategic problems systematically and to give advice for behavior in concrete economic situations.

Content
Main topic is non-cooperative game theory. Models, solution concepts and applications are discussed for simultaneous as well as sequential games. Different equilibrium concepts are introduced and a short introduction to cooperative game theory is given.

Media
Folien, Übungsblätter.

Basic literature
Gibbons, A primer in Game Theory, Harvester-Wheatsheaf, 1992

Complementary literature
• Binmore, Fun and Games, DC Heath, Lexington, MA, 1991
Course: Simulation I

**Course key:** [25662]

**Lecturers:** Karl-Heinz Waldmann

**Credit points (CP):** 5

**Hours per week:** 2/1/2

**Term:** Wintersemester

**Level:** 4

**Teaching language:** Deutsch

**Part of the modules:** Decision Theory [IW3WWDEC0] (S. 34), Applied Finance [IW3WWFIN0] (S. 39), Quantitative Finance [IW3WWFIN2] (S. 42)

**Learning Control / Examinations**

The assessment consists of an 1h written exam according to Section 4 (2), 1 of the Prüfungsordnung für Informationswirtschaft. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by 0.3.

**Prerequisites**

Foundations in the following fields are required:

- Operations Research, as lectured in *Introduction to Operations Research I* [25040] and *Introduction to Operations Research II* [25043].
- Statistics, as lectured in *Statistics I* [25008/25009] and *Statistics II* [25020/25021].

**Conditions**

None.

**Learning Outcomes**

The lecture provides insights into the typical process in planning and conducting simulation studies.

**Content**

As the world is getting more complex it is often not possible to analytically provide key figures of interest without overly simplifying the problem. Thus efficient simulation techniques become more and more important. In the lecture important basic concepts are presented in terms of selected case studies.

Topics overview: Discrete event simulation, generation of random numbers, generating discrete and continuous random variables, statistical analysis of simulated data, variance reduction techniques, case studies.

**Media**

Blackboard, Slides, Flash Animations, Simulation Software

**Basic literature**

- Lecture Notes

**Complementary literature**


**Remarks**

The lecture is offered irregularly. The curriculum of the next two years is available online.
Course: Efficient Algorithms

Lecturers: Hartmut Schmeck
Credit points (CP): 5 Hours per week: 2/1
Term: Sommersemester Level: 3
Teaching language: Deutsch
Part of the modules: Algorithm Design [IW3INALG0] (S. 26)

Learning Control / Examinations
The assessment consists of assignments or of a bonus exam (wrt §4 (2), 3 SPO), and a written exam (60 min.) in the week after the end of the lecturing period (§4 (2), 1 SPO).
If the mark obtained in the written exam is in between 1.3 and 4.0, a successful completion of the assignments or the bonus exam will improve the mark by one level (i.e. by 0.3 or 0.4).
Deviations from this type of assessment are announced at the beginning of this course.

Prerequisites
credits for the Informatics modules of years 1 and 2.

Conditions
None.

Learning Outcomes
The student will learn how to use methods and concepts of efficient algorithms and how to demonstrate adequate innovative capabilities with respect to the used methods.
This course emphasizes the teaching of advanced concepts for the design and application of algorithms, data structures, and computer infrastructures in relation to their applicability in the real world. Based on a fundamental understanding of the covered concepts and methods, students should know how to select appropriate concepts and methods for problem settings in their professional life, and, if necessary, to extend and apply them in an adequate form. The students should be enabled to find adequate arguments for justifying their chosen problem solutions.

Content
In a problem oriented way the course presents systematic approaches to the design and analysis of efficient algorithms using standard tasks of information processing as generic examples. Special emphasis is put on the influence of data structures and computer architectures on the performance and cost of algorithms. In particular, the course emphasizes the design and analysis of algorithms on parallel computers and in hardware, which is increasingly important considering the growing presence of multicore architectures.

Media
- powerpoint slides with annotations using a tablet pc
- access to applets and Internet ressources
- lecture recording (camtasia)

Basic literature
Borodin, Munro: The Computational Complexity of Algebraic and Numeric Problems (Elsevier 1975)
Cormen, Leiserson, Rivest: Introduction to Algorithms (MIT Press)
Sedgewick: Algorithms (Addison-Wesley) (many different versions available)

Complementary literature
will be announced in class
Course: Algorithms for Internet Applications

Course key: [25702]

Lecturers: Hartmut Schmeck
Credit points (CP): 5
Hours per week: 2/1
Term: Wintersemester
Level: 4
Teaching language: Englisch

Part of the modules: Information Services in Networks [IW3INIDL0] (S. 29)

Learning Control / Examinations

The assessment consists of a written exam (60 min) (according to Section 4(2), 1 of the examination regulation) and an additional written examination (called "bonus exam", 60 min) (according Section 4(2), 3 of the examination regulation) (the bonus exam may be split into several shorter written tests).

The grade of this course is the achieved grade in the written examination. If this grade is at least 4.0 and at most 1.3, a passed bonus exam will improve it by one grade level (i.e. by 0.3 or 0.4).

Prerequisites
None.

Conditions
None.

Learning Outcomes

The students will learn to master methods and concepts of essential algorithms within Internet applications and to develop capabilities for innovative improvements. The course aims at teaching advanced concepts for the design and application of algorithms with respect to the requirements in networked systems. Based on a fundamental understanding of taught concepts and methods the students should be able to select appropriate concepts and methods for problem settings in their future professional life, and - if necessary - customize and apply them in an adequate way. The students will be capable to find appropriate arguments for their chosen approach to a problem setting.

In particular, the student will:
- know the structure and elementary protocols of the Internet (TCP/IP) and standard routing algorithms (distance vector and link state routing),
- know methods of information retrieval in the WWW, algorithms for searching information and be able to assess the performance of search engines,
- know how to design and use cryptographic methods and protocols to guarantee and check confidentiality, data integrity and authenticity,
- know algorithmic basics of electronic payment systems and of electronic money,
- the architectures and methodologies of firewalls.

Content

Internet and World Wide Web are changing our world, this core course provides the necessary background and methods for the design of central applications of the Internet. After an introduction into Internet technology the following topics are addressed:

- information retrieval in the www, structure and functioning of search engines, foundations of secure communication, electronic payment systems and digital money, and - if time permits - security architectures (firewalls), data compression, distributed computing on the Internet.

Media

Powerpoint slides with annotations on graphics screen, access to Internet resources, recorded lectures

Basic literature


Complementary literature

- Further references will be given in the course.
Course: Workflow-Management

Lecturers: Andreas Oberweis
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
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
Knowledge of course Applied Informatics I - Modelling [25070] is expected.

Conditions
None.

Learning Outcomes
Students are familiar with the concepts and principles of workflow management concepts and systems and their applications. Based on theoretical foundations they can model business process models. Furthermore they have an overview of further problems of workflow management systems in commercial use.

Content
A workflow is that part of a business process which is automatically executed by a computerized system. Workflow management includes the design, modelling, analysis, execution and management of workflows. Workflow management systems are standard software systems for the efficient control of processes in enterprises and organizations. Knowledge in the field of workflow management systems is especially important during the design of systems for process support. The course covers the most important concepts of workflow management. Modelling and design techniques are presented and an overview about current workflow management systems is given. Standards, which have been proposed by the workflow management coalition (WFMC), are discussed. Petri nets are proposed as a formal modelling and analysis tool for business processes. Architecture and functionality of workflow management systems are discussed. The course is a combination of theoretical foundations of workflow management concepts and of practical application knowledge.

Media
Slides, Access to internet resources.

Basic literature

Complementary literature
Course: Software Technology: Quality Management

Course key: [25730]

Lecturers: Andreas Oberweis
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
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.

Conditions
None.

Learning Outcomes
Students are familiar with basic concepts and principles of software quality and software quality management. They know key measures and models for certification of quality in software development. They are aware of different test methods and evaluation methods. Furthermore, they are able to assess quality management aspects in different standard process models.

Content
This lecture imparts fundamentals of active software quality management (quality planning, quality testing, quality control, quality assurance) and illustrates them with concrete examples, as currently applied in industrial software development. Keywords of the lecture content are: software and software quality, process models, software process quality, ISO 9000-3, CMM(I), BOOTSTRAP, SPICE, software tests.

Media
Slides, access to internet resources.

Basic literature
- Peter Liggesmeyer: Software-Qualität, Testen, Analysieren und Verifizieren von Software. Spektrum Akademischer Verlag 2002

Complementary literature
Further literature is given in lectures.
Course: Business Process Modelling

Lecturers: Andreas Oberweis, Marco Mevius
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
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.

Conditions
None.

Learning Outcomes
Students know goals of business process modelling and master different modelling languages. They are able to choose the appropriate modelling language according to a given context and to use the modelling language with suitable modelling tools. They master methods for analysing and assessing process models and methods for analysing them according to specific quality characteristics.

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.

Media
Slides, access to internet resources.

Basic literature
Literature will be given in the lecture.
Course: Knowledge Management

Lecturers: Rudi Studer
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4  
Teaching language: Deutsch

Part of the modules: Business Process Engineering [IW3INGP0] (S. 28), Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
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
Basics in logic, e.g. from lecture Foundations of Informatics 1.

Conditions
None.

Learning Outcomes
Making students sensitive to the problems of corporate knowledge management, knowledge about the central dimensions of influence as well as of relevant technologies for supporting knowledge management.

Content
In modern corporations, knowledge is an increasingly important aspect for fulfilling central tasks (amelioration of business processes, increasing innovation, increasing customer satisfaction, strategic planning and the like). Therefore, knowledge management has become a determining factor of success.
The lecture covers the different types of knowledge that play a role in knowledge management, the corresponding knowledge processes (generation, capture, access and usage of knowledge) as well as methodologies for the introduction of knowledge management solutions.
The lecture will further emphasize the following computer science techniques for knowledge management:

- Communities of Practice, Collaboration Tools, Skill Management
- ontology-based knowledge management
- Business Process oriented Knowledge Management
- Personal Knowledge Management
- Case Based Reasoning (CBR)

Media
Slides and scientific publications as reading material.

Basic literature
- C. Beierle, G. Kern-Isberner: Methoden wissensbasierter Systeme, Vieweg, Braunschweig/Wiesbaden, 2. überarb. Auflage, 2005

Complementary literature
Course: Semantic Web Technologies I

Lecturers: Rudi Studer, Sebastian Rudolph
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28), Information Services in Networks [IW3INIDLO] (S. 29)

Learning Control / Examinations
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
Lectures on Informatics of the Bachelor on Information Management (Semester 1-4) or equivalent.

Conditions
None.

Learning Outcomes
- Basic knowledge about the main ideas and the realisation of Semantic Web Technologies

Content
“Semantic Web” denotes an extension of the World Wide Web by meta data and applications in order to make the meaning (semantics) of data on the web usable by intelligent systems, e.g. in e-commerce and internet portals. Central to this is the representation and processing of knowledge in form of ontologies. This lecture provides the foundations for knowledge representation and processing for the corresponding technologies and presents example applications. It covers the following topics:
- Extensible Markup Language (XML)
- Resource Description Framework (RDF) and RDF Schema
- Web Ontology Language (OWL)
- Rule Languages
- Applications

Media
Slides.

Basic literature

Complementary literature
Course: Intelligent Systems in Finance

Lecturers: Detlef Seese
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30), eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38)

Learning Control / Examinations
The assessment is a written examination.
See the German part for special requirements to be admitted for the examination.

Prerequisites
None.

Conditions
None.

Learning Outcomes
- The students acquire abilities and knowledge of methods and systems from the area of machine learning and learn how to use them in the area of finance, which is the core area of application of this lecture.
- It is taught the ability to choose and change these methods and systems adequate to the situation and to use them for problem solving in the area of finance.
- The students get the ability to find strategic and creative answers in their search for solutions for precisely defined, concrete and abstract problems.
- At the same time the lecture aims to give foundational knowledge and methods in the context of their application in practise.
- On the basis of the basic understanding of concepts and methods of informatics the students should be able to comprehend quickly the new developments in the area and to use them correctly.

Content
A new generation of computing methods, commonly known as “intelligent systems”, has recently been successfully applied to a variety of business and financial modelling tasks. In many application fields these novel methods outperform traditional statistical techniques. The lecture provides a comprehensive coverage of the area, including foundations and applications. In particular it deals with intelligent software agents, genetic algorithms, neural networks, support vector machines, fuzzy-logic, expert systems and intelligent hybrid systems. The presented applications focus on the finance area and are related to risk management (credit risk, operational risk), financial trading, portfolio management and economic modelling. The lecture is given in cooperation with the company msgGILLARDON. The lecture starts with an introduction of the central problems of application in this area, e.g. decision support for investors, Portfolio selection under constraints, information retrieval from business reports, automatic development of trading rules for the capital market, modelling of time series at the capital market, explanation of phenomena at capital markets by simulation, decision support in risk management (credit risk, operational risk). After this the basics of intelligent systems are discussed. Basic ideas and essential results for different stochastic heuristics for local search are discussed next, especially Hill Climbing, Simulated Annealing, Threshold Accepting and Tabu Search. After this different population-based approaches of evolutionary methods are presented, e.g. Genetic Algorithms, Evolutionary Strategies and Programming, Genetic Programming, Memetic Algorithms and Ant-Algorithms. It follows an introduction into Neural Networks, Support Vector Machines and Fuzzy logic.

Software agents and agentbased stock market models are the next topic. The lecture ends with an overview on the complexity of algorithmic problems in the area of finance, giving in this way one of the key reasons for the necessity to use heuristics and intelligent systems. Essential examples and basic applications are chosen from the area of finance.

Media
Slides.

Basic literature
There is no textbook covering completely the content of the lecture.
Further references will be given in each lecture.

**Complementary literature**

- Further references will be given in the lecture.

**Remarks**

The content of the lecture will permanently be adapted to actual developments. This can be the cause to changes of the described contend and schedule.
Course: Service Oriented Computing 1  

Course key: [25770]  

Lecturers: Stefan Tai  

Credit points (CP): 5  

Hours per week: 2/1  

Term: Wintersemester  

Level: 4  

Teaching language: Deutsch  

Part of the modules: Information Services in Networks [IW3INIDL0] (S. 29)  

Learning Control / Examinations  
The assessment of this course is a written examination (60min.) in the first week after lecture period (nach §4(2), 1 SPO).  

Prerequisites  
Lecture AI2 [25033] is recommended.  

Conditions  
None.  

Learning Outcomes  
The course introduces concepts, methods, and techniques of “service-oriented computing”, including languages for (Web) service description, methods and tools for the development of services, and platforms (middleware, runtimes) for the Web-based deployment, delivery, and execution of services. In addition, software-as-a-service models and emerging trends (incl. Cloud Computing) will be presented and discussed. The course provides a solid technical foundation that enables the student to address the increasingly relevant challenges of developing “service-oriented architectures (SOA)” in the industry.  

Content  
Web services represent the next-generation of Web technology, and are an evolution of conventional distributed middleware. They enable new and improved ways for enterprise computing, including application interoperability and integration, and business process management. Modern software systems are being designed as service-oriented architectures (SOA), introducing increased agility and flexibility at both the software systems and the business level. Web services and SOA thus have a profound impact on software development and the businesses that they support. The course “Service-oriented Computing” introduces the concepts, methods and technology that provide a solid foundation in this area. Topics include:  

• Service description  
• Service engineering, including development and implementation  
• Service composition (aggregation), including process-based service orchestration  
• Interoperability formats and protocols  
• Service platforms and runtimes (middleware)  
• Software-as-a-Service models  
• Service intermediaries (markets)  
• Mashups and situational applications  
• Cloud computing  

Media  
Slides, access to internet resources.  

Basic literature  
Will be announced in the lecture.
Course: Enterprise Architecture Management  
Course key: [25786]

Lecturers: Thomas Wolf  
Credit points (CP): 5  
Hours per week: 2/1  
Term: Wintersemester  
Level: 3  
Teaching language: Deutsch  
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
The assessment of this course is a written or (if necessary) oral examination according to §4(2) of the examination regulation.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Students understand the connection between enterprise strategy, business processes and business objects and IT architecture; they know methods to depict these connections and how they can be developed based on each other.

Content
The following topics will be covered: components of enterprise architecture, enterprise strategy including methods to develop strategies, business process (re)engineering, methods to implement changes within enterprises (management of change)

Media
Slides, access to internet resources.

Basic literature
- Doppler, K., Lauterburg, Ch.: Change Management. Campus Verlag 1997
Course: Capability maturity models for software and systems engineering  
Course key: [25790]

Lecturers: Ralf Kneuper
Credit points (CP): 4  
Hours per week: 2
Term: Sommersemester  
Level: 3
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
The assessment consists of an 1h written exam in the first week after lecture period.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Students master the basics of capability maturity models, oversee the whole process in project management and development processes according to CMMI and SPICE. They know how to use capability maturity models for quality assurance.

Content
Capability maturity models like CMMI and SPICE are an important tool for assessing and improving software development. A significantly increasing number of companies use these models in their own approach to improve their development and to demonstrate a certain minimum quality and effective external presentation. This is the case in Germany, especially in the automotive industry, but also many other industries.

Preliminary Structure of the lecture:
1. Introduction and Overview, motivation
2. Project management according to CMMI
3. Development processes according to CMMI
4. Process management and supporting processes according to CMMI
5. Differences between SPICE and CMMI
6. Introduction of capability maturity models
7. Assessments and Appraisals
8. Costs and benefits of capability maturity models

Media
Slides, access to internet resources.

Basic literature
Literature is given in each lecture individually.
Course: Management and Strategy

Lecturers: Hagen Lindstädt
Credit points (CP): 4  Hours per week: 2/0
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45), Strategy and Interaction [IW3WWORG1] (S. 46)

Learning Control / Examinations
The assessment consists of a written exam (60 min) taking place at the beginn of the recess period (according to §4 (2), 1 of the examination regulation). The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites
None.

Conditions
None.

Learning Outcomes
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.

Content
- 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

Media
Slides.

Basic literature

The relevant excerpts and additional sources are made known during the course.
Course: Special Topics in Management: Management and IT

Course key: [25907]

Lecturers: Hagen Lindstädt
Credit points (CP): 2  Hours per week: 1/0
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45)

Learning Control / Examinations
The assessment consists of a written exam (30 min) at the beginning of the recess period (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.

Conditions
None.

Learning Outcomes
The course discusses management questions and concepts that are clearly motivating from a current and practical perspective. Here the integration of IT and process issues into corporate management from the management's perspective is one of the subjects of particular interest. The event takes place in close cooperation with leading, practical managers.

Content
(Excerpt):
- A summary of current management concepts and questions.

Media
Slides.

Basic literature
The relevant excerpts and additional sources are made known during the course.
Course: Modeling Strategic Decision Making

Lecturers: Hagen Lindstädt
Credit points (CP): 6  Hours per week: 2/1
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45), Modeling Strategic Decision Making and Economic Incentives [IW3WWORG2] (S. 47)

Learning Control / Examinations
Written exam 100% following §4, Abs. 2.

Prerequisites
None.

Conditions
Following § 17, 3 of „Prüfungsordnung Informationswirtschaft“ a seminar of this module has to be chosen and completed.

Learning Outcomes
Starting from the basic model of economic decision theory, fundamental decision principles and calculi for multi-attribute decisions in certain and uncertain conditions up to subjective expected utility theory and the economic assessment of information are described. To confront numerous infringements by decision-makers against principles and axioms of this calculus, in addition non-expected utility calculi and advanced models for decisions by economic agents are discussed; these are especially important for management decisions.
Within the chapter concerning leadership frameworks the students are given the possibility to individually analyze their management style on the basis of classical concepts of leadership. These concepts will be presented and discussed in detail.

Content
• Principles of strategic management decisions
• Leadership: Classical leadership concepts
• Basic economic decision models
• Limits of the basic models and advanced concepts
• Advanced models: individual decisions with uncertainty and vague information

Media
Slides.

Basic literature
Course: Seminar: Management and Organization

Lecturers: Hagen Lindstädt
Credit points (CP): 4  Hours per week: 2
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45), Modeling Strategic Decision Making and Economic Incentives [IW3WWORG2] (S. 47)

Learning Control / Examinations
Term paper (50%) and presentation (50%).

Completion of all 1st and 2nd year modules of the Bachelor Program or Admission to the Master Program.

Prerequisites
See corresponding module information.

Conditions
None.

Learning Outcomes
The aim of the seminar is to describe corporate and organizational management approaches, to assess them critically and clarify them using practical examples. The focus is on assessing the models with a view to their applicability and theoretical limits.

Content
The subjects are redefined each semester on the basis of current issues.

Media
Slides.

Basic literature
The relevant sources are made known during the course.
Course: Seminar: Management and Organization

Lecturers: Hagen Lindstädt
Credit points (CP): 4  Hours per week: 2
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45), Modeling Strategic Decision Making and Economic Incentives [IW3WWORG2] (S. 47)

Learning Control / Examinations
Term paper (50%) and presentation (50%).

Prerequisites
Completion of all 1st an 2nd year modules of the Bachelor Program or Admission to the Master Program.

Conditions
None.

Learning Outcomes
The aim of the seminar is to describe corporate and organisational management approaches, to assess them critically and clarify them using practical examples. The focus is on assessing the models with a view to their applicability and theoretical limits.

Content
The subjects are redefined each semester on the basis of current issues.

Media
Slides.

Basic literature
The relevant sources are made known during the course.

Course key: [25916]
Course: Fundamentals of Production Management

Lecturers: Frank Schultmann
Credit points (CP): 5.5  Hours per week: 2/2
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Formulation of basic problems and development of solutions in the framework of production management.

Content
This lecture is designed as an introduction to Industrial Production. It focuses on among others on strategic production management and ecological aspects. After an introduction in production management and system theory, topics treated cover industrial R&D, siting, industrial logistics as well as reverse logistics and finally transport and stockkeeping. The topics presented are additionally illustrated by several case studies from industry.

Media
Media will be provided on learning platform.

Basic literature
will be announced in the course
Course: Planning and Management of Industrial Plants

Lecturers: Frank Schultmann
Credit points (CP): 5.5  Hours per week: 2/2
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Media
Media will be provided on the e-learning platform.

Basic literature
will be announced in the course
Course: Production and Logistics Management

Lecturers: Magnus Fröhling, Frank Schultmann
Credit points (CP): 5.5  Hours per week: 2/2
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content
Within this lecture the main topics of operational production and logistics planning are presented. This comprises structure and functions of of production planning and control systems (PPC systems) as well as enterprise resource planning systems (ERP systems) and Advanced Planning Systems (APS). Planning tasks and exemplary methods, e.g. for master production scheduling (MPS), material requirements planning (MRP I) (demand planning, lot sizing), as well as sequencing, scheduling and capacity planning are discussed. Based on the MRP II concept also integrated approaches for PPC are introduced. Finally an overview on PPC and Enterprise Resource Planning and Advanced Planning Systems that are available on the market are given.

Media
Media will be provided on the e-learning platfrom.

Basic literature
will be announced in the course
Course: Material and Energy Flows in the Economy

Course key: [25960]

Lecturers: Michael Hiete
Credit points (CP): 3.5  Hours per week: 2/0
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
The successful completion of the modules in semester 1-4 except for up to two modules. The module Internship [IW1EXPRAK] and the law modules [IW1JURA1,2,3] are not relevant in this calculation.

Conditions
None.

Learning Outcomes

Content

Basic literature
will be announced in the course
Course: Exhaust Emissions (VWL), Emissions into the Environment (ING)  
Course key: [25962]

Lecturers: Ute Karl  
Credit points (CP): 3.5  
Hours per week: 2/0  
Term: Wintersemester  
Level: 4  
Teaching language: Deutsch  
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content

Complementary literature
Compilation of documents will be released in the lecture.
Course: The Management of R&D Projects with Case Studies

Lecturers: Helwig Schmied
Credit points (CP): 3.5  Hours per week: 2/2
Term: Winter-/Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None

Learning Outcomes

Content
• The communication between R&D, Production and Marketing
• Problems concerning the measurement of the productivity of the R&D system
• Methods for improving the productivity of the R&D system
• Planning of R&D projects with the help of the Communication Matrix-Methods for controlling R&D projects’ progress
• The marketing of scientific competencies
• The Communication Matrix as tool for the implementation of simultaneous engineering
• Case studies

Basic literature
will be announced in the course
Course: Computer-based Planning and Control of Production and Simulation of Processes

Course key: [25975]

Lecturers: Magnus Fröhling, Dominik Möst, Frank Schultmann
Credit points (CP): 3.5  Hours per week: 2/0
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content
After an introduction into the structure, the history and still existent shortcomings of systems for planning and control of production, this lecture introduces different approaches for computer-assisted planning. The approaches are subdivided into methodologies for the simulation of processes on the one hand and optimising and descriptive planning models on the other hand. Finally, commercially available, industry-specific software tools are described, focussing on for production planning (PP) and materials management (MM) out of the mySAP ERP system from SAP. In this context the lecture is completed by computer-assisted courses in production planning and materials management with the help of the mySAP ERP system from SAP.

Media
Media will be provided on the e-learning platform.

Basic literature
will be announced in the course
Course: Material Flow Analysis and Life Cycle Assessment

Lecturers: Liselotte Schebek
Credit points (CP): 3.5  Hours per week: 2/0
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
See module description.

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content
Materials – in the sense of raw materials taken from nature – represent the physical basis of the economy and the human society in general. At the same time, global environmental problems, e. g., the greenhouse effect, as well as economic problems, e.g., the availability and the price development of raw materials, are directly linked to the increasing use of specific materials like fossil carbon resources or metals. Hence, for the development of solution strategies, the understanding of material flow systems of the techno-sphere, i. e. the environment made by humans, is essential. The lecture is an introduction into basic system theory and modelling techniques of material flow analysis. On this basis, the methodology of the Life Cycle Assessment (LCA) is then presented, which comprises material flows and their environmental effects throughout the entire life cycle of production, use and disposal of products. For decision-makers in economy and policy, LCA serves as an instrument of analysis in order to compare the different possibilities of the design of products, technologies and services. In this lecture, the structure and particular modules of the Life Cycle Assessment are presented in detail. Furthermore, the applications of the Life Cycle Assessment in the context of decision support are explained, in particular within the context of development of innovative technologies. Recent developments of the Life Cycle Costing and the Social LCA will also be considered.

Basic literature
will be announced in the course
Course: Competition in Networks

Course key: [26240]

Lecturers: Kay Mitusch
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Analytical CRM [IW3WWCRM1] (S. 32), Operative CRM [IW3WWCRM2] (S. 33), eBusiness Management [IW3WWEBM0] (S. 35)

Learning Control / Examinations
The assessment consists of a written exam following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
Basics of microeconomics obtained within the undergraduate programme (B.Sc) of economics are required. Useful, but not necessary, are basic knowledge of industrial economics, principal agent theory, and contract theory.

Conditions
None.

Learning Outcomes
The lecture provides the students with the basic economic understanding of network industries like telecom, utilities, IT and transport sectors. Students are prepared for a possible job in the network industries. The student should get a vivid idea of the special characteristics of network industries concerning planning, competition, competitive distortion and state intervention. He should be able to apply abstract concepts and formal methods to use in these fields.

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

Basic literature
Will be announced in the lecture.

Remarks
Beginning in WT 2009/2010, the lecture Competition in Networks [26240] will always be held during the winter term.
Course: Managing New Technologies

Lecturers: Thomas Reiß
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45), Modeling Strategic Decision Making and Economic Incentives [IW3WWORG2] (S. 47)

Learning Control / Examinations
Written exam 100% following §4, Abs. 2.

Prerequisites
None.

Conditions
None.

Learning Outcomes
New technologies can contribute substantially to the international competitiveness of different industrial sectors. This course provides the necessary knowledge for understanding how industrial enterprises and policy-makers are dealing with the challenge to realise in time the potentials of new technologies and to use them most efficiently. Key tasks of the management of new technologies will be practised.

Content
The course provides an overview of the international development of a selected number of key technologies such as biotechnology, nanotechnology, neurotechnologies, converging technologies. Methods for monitoring new technologies including foresight approaches will be presented and the economic and social impacts of new technologies will be discussed.

Media
Slides.

Basic literature
- Hausschildt/Salomo: Innovationsmanagement; Borchert et al.: Innovations- und Technologiemanagement;
- Specht/Möhrle; Gabler Lexikon Technologiemanagement
Course: Management of Business Networks

Lecturers: Christof Weinhardt, Jan Kraemer
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 4
Teaching language: Englisch
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35), Supply Chain Management [IW3WWEBM1] (S. 37)

Learning Control / Examinations
The assessment of this course is a written examination (60 min) (following §4(2), 1 SPO) and by submitting written papers as part of the exercise (following §4, Abs. 2, 3 SPO). The total grade for this lecture will consist to 50% of the grade achieved in the written mid term examination, to 10% of the assignments during the exercises, and to 40% of a project work, which includes a term paper and a presentation.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The student will become acquainted with the theoretical fundamentals of economic networks and how to manage them. Support of economic networks by information systems will be accomplished by several case studies, which will be worked on by groups autonomously. Basic knowledge of organisation theory, network analysis, strategic & operative management and logic systems will be communicated to the student. Furthermore, he will have a focused view on the mechanisms and supporting tools for interaction between companies, especially in negotiations and negotiation-supporting systems. In small groups, the student is trained in team-oriented and autonomous working techniques. Within this domain, the student will be trained to seek and read relevant technical literature in English, the language of science, and to adopt it to a specific problem.

Content
The significant and lasting impact of web-based business-to-business (B2B) networks has just recently become apparent. The exploratory phase during the first Internet hype bred a variety of approaches which were often bold in business nature, yet simple and unfounded in system architecture. Only very few survived and proved sustainable. Nowadays web-based B2B networks are increasingly reappearing and even promoted by major traditional companies and governments. However, this new wave of networks is more mature and more powerful in functionality than their predecessors. As such they provide not only auction systems but also facilities for electronic negotiation. This implies a shift from price-focused to relationship-oriented trading. But what motivates this shift? Why do firms enter business networks? How can these networks be best supported by IT? The course intends to resolve these questions. Firstly, an introduction in organization theory will be given. Secondly, the problems of networks will be addressed. Thirdly, an analysis of how IT can alleviate those problems will be undertaken.

Media
Powerpoint presentations, recorded lecture available on the internet, (if circumstances allow videoconferencing).

Basic literature
Course: eFinance: Information Engineering and Management for Securities Trading

Course key: [26454]

Lecturers: Christof Weinhardt, Ryan Riordan
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester   Level: 4
Teaching language: Deutsch
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35), eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38)

Learning Control / Examinations
70% of the mark is based on the written examination and 30% is based on assignments during the exercises.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The goal of the lecture is to make the students familiar with the theoretical as well as the practical aspects of electronic trading and exchanges and the IT systems used in the financial industry. While markets for products and services are discussed, the focus is on the trading of financial securities. Existing centralized equity exchanges face competition from new alternative trading systems made possible by today’s information technology. This course will also examine the impact and implications of this dynamic. The focus is on the economic and technical design of markets as information processing systems.

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

Media
Powerpoint presentations, recorded lecture available on the internet

Basic literature

Complementary literature
Course: eServices

Lecturers: Christof Weinhardt, Gerhard Satzger
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 3
Teaching language: Englisch
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35)

Learning Control / Examinations
The assessment consists of a written examination (60 min.) according to Section 4(2), 1 of the examination regulation and by submitting written papers as part of the exercise (accoring to Section 4(2), 3 of the examination regulation).

Prerequisites
None.

Conditions
None.

Learning Outcomes
This lecture presents concepts, methods and application examples for the engineering and management of eServices. The students will get to know the basic principles and elements of eServices and their specific properties compared to physical goods. Creating eServices needs an overall view of information technology with regards to flexibility, safety, data security, measurability and cost allocation.

In addition, problems and solutions in designing and providing eServices are discussed; the elementary relationship to information management will also be treated. Application examples from industry stress the concepts’ application in the economy.

Content
So far, management studies usually focused on physical goods. However, due to the increasing development of information and communication technology, distribution of electronic services is becoming more important. Electronic services are characterized by an increasing degree of intangibility, interactivity and individuality. Traditional, goods-oriented models, methods and tools for are often found to be inadequate for service engineering and management.

Building on a systematic categorization of (e)Services, we cover concepts and foundations for engineering and managing IT-based services, allowing further specialization in subsequent courses. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services.

In addition, application examples, guest lectures (e.g. business model changes driven by the advent of eServices) and a number of hands-on exercises will illustrate the applicability of the concepts.

Media
PowerPoint slides;
Course: Practical seminar Information Engineering and Management  
Course key: [26477]

Lecturers: Christof Weinhardt  
Credit points (CP): 1  
Hours per week: 0*  
Term: Winter-/Sommersemester  
Level: 4  
Teaching language: Deutsch  
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35), Supply Chain Management [IW3WWEBM1] (S. 37),  
eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38)

Learning Control / Examinations  
The student is evaluated based on the written work, a presentation of the results in front of an audience and his contribution to the discussion.

Prerequisites  
None.

Conditions  
The practical seminar is a supplement to the course seminar Information Engineering and Management [26474] and it can only be chosen in conjunction with the course [26474].

Learning Outcomes  
The student should be able to do a literature review based on a predefined topic in the context of information engineering and management. The approach comprises the identification of relevant literature according to the topic and an analysis as well as an evaluation of the methods presented in the literature. The student learns to present his results in a paper and in front of an audience on a academic level. This process gives him the knowledge and practice for further research work like a master thesis or a doctoral thesis.

Content  
As a supplement to the seminar Information Management and Engineering [26474] the student has to analyse the selected topic from course [26474] by applying practical methods, e.g. implementation of algorithms or creating a market survey.

Media  
- PowerPoint slides  
- eLearning Platform Ilias  
- Software Development Tools

Basic literature  
The student will receive the necessary literature for his research topic.

Remarks  
- Students from Bachelor and Master Course can visit the practical seminar. The research topic as well as the evaluation of the work and the presentation will have a different focus between Bachelor and Master Course.
- All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen. The current topics of the practical seminars are available at the following homepage: http://www.im.uni-karlsruhe.de/lehre.
- *) The practical seminar is a supplement to the seminar Seminar Information Engineering and Management [26474] and does not require additional semester periods per week.
Course: Customer Relationship Management

Lecturers: Andreas Geyer-Schulz
Credit points (CP): 5 Hours per week: 2/1
Term: Wintersemester Level: 4
Teaching language: Englisch
Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Analytical CRM [IW3WWCRM1] (S. 32), Operative CRM [IW3WWCRM2] (S. 33)

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 12) from excersise work will be added. The grades of this lecture are assigned following the table below:

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Prerequisites
None.

Conditions
None.

Learning Outcomes
The students
• understand service management as an economic basis for Customer Relationship Management and learn the resulting consequences for the management, the organisation itself and their departments,
• design and develop service concepts and service systems at a conceptual level,
• work on case studies in the CRM-area in small groups with limit time,
• learn English as the technical language in the area of CRM and consult internationale literature from this field for the case studies.

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

Media
Slides

Basic literature

Complementary literature
Course: Operative CRM

Lecturers: Andreas Geyer-Schulz
Credit points (CP): 5  Hours per week: 2/1
Term: Wintersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Operative CRM [IW3WWCRM2] (S. 33)

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 12) from excersise work will be added. The grades of this lecture are assigned following the table below:

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Prerequisites
None.

Conditions
The attendance of courses Customer Relationship Management [26508] and Analytical CRM [26522] is advised.

Learning Outcomes
The Student
- understands the theory of methods for process and data analyses and applies them for the design and implementation of operative CRM-processes in the complex context of companies,
- takes privacy problems into account,
- evaluates existing operative CRM-processes in companies and gives recommendation for their improvement. This requires the knowledge of example processes and the ability to transform them according to the given setting.
- uses literature for the solution of case studies, communicates with professionals and summarizes his recommendations and drafts in precise and coherent texts.

Content
The Student should be able to understand and implement methods and applications within the operative CRM. This includes, but is not limited to the analysis of business processes, as a basis for improvements in CRM, and applications like call centers.

Basic literature

Complementary literature
Chris Todman. Designing a Data Warehouse: Supporting Customer Relationship Management.
Course: Analytical CRM  

Lecturers: Andreas Geyer-Schulz  
Credit points (CP): 5  
Hours per week: 2/1  
Term: Sommersemester  
Level: 3  
Teaching language: Deutsch  
Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Analytical CRM [IW3WWCRM1] (S. 32)

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting written papers as part of the exercise following §4 (2), 3 of the examination regulation.

The course is considered successfully taken, if at least 50 out of 100 points are acquired in the written exam. In this case, all additional points (up to 12) from exercise work will be added. The grades of this lecture are assigned following the table below:

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Prerequisites
None.

Conditions
We expect knowledge about data models and the UML modelling language concerning information systems.

Learning Outcomes
The Student should
- understand the principal scientific methods from statistics and informatics used in analytical CRM and their application to enterprise decision problems and be able to independently apply these methods to standard cases,
- understand the components for creating and managing a data warehouse from operative system sources including the processes and steps involved and should be able to apply these methods to a simple example, and
- use his knowledge to conduct a standard CRM analysis on enterprise data for a business decision problem and deduce and justify a recommendation for appropriate action.

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

Media
slides

Basic literature
Course: Bachelor Seminar in Information Engineering and Management  
Course key: [26524]

Lecturers: Andreas Geyer-Schulz  
Credit points (CP): 2  
Hours per week: 2  
Term: Winter-/Sommersemester   
Level: 3  
Teaching language: Deutsch

Part of the modules: Customer Relationship Management (CRM) [IW3WWCRM0] (S. 31), Analytical CRM [IW3WWCRM1] (S. 32), Operative CRM [IW3WWCRM2] (S. 33)

Learning Control / Examinations  
The assessment of this course is according to §4(2), 3 of the Prüfungsordnung für Informationswirtschaft in form of an examination of the written seminar thesis and a presentation. The final mark is based on the examination of the written seminar thesis but can be upgraded or downgraded according to the quality of the presentation.

Prerequisites  
See corresponding module description. Furthermore, knowledge from CRM is required. Therefore, the lecture Customer Relationship Management [26508] (or a similar one) has to be attended parallel or before the seminar.

Conditions  
None.

Learning Outcomes  
The student is able to

- to perform a literature search for a given topic, to identify, find, value and evaluate the relevant literature.
- to write his seminar thesis (and later on, the bachelors/masters thesis) with the text setting system LaTeX and include format requirements as used by scientific publishers.
- to do a presentation in an adequate scientific manner.
- to write down the results of his investigations in the form of scientific publications.

Content  
This seminar serves as an introduction into the process of scientific work. Students write a review for a selected scientific article. A profound literature search is required to judge the article. The review is written with LaTeX by using formatting styles similar to those of scientific publishers.

The seminar treats questions of Customer Relationship Management.

Basic literature  
A CRM-specific article is assigned to every student participating in this seminar. The chosen articles are published in the beginning of every term.

Complementary literature  
Course: Derivatives

Lecturers: Marliese Uhrig-Homburg
Credit points (CP): 5  Hours per week: 2/1
Term: Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38), Applied Finance [IW3WWFIN0] (S. 39), Quantitative Finance [IW3WWFIN2] (S. 42)

Learning Control / Examinations
The assessment consists of a written exam following §4, Abs. 2, 1 of the Prüfungsordnung für Informationswirtschaft and of possible assignments during the course as an "Erfolgskontrolle anderer Art" following § 4, Abs. 2, 3 of the Prüfungsordnung für Informationswirtschaft.

Prerequisites
None.

Conditions
None.

Learning Outcomes
The objective of the Derivatives lecture is to become familiar with financial markets, especially derivatives markets. Traded securities and frequently used trading strategies will be introduced. Furthermore the pricing of derivatives will be derived and their use in risk management will be discussed.

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

Media
Slides, Exercises/Exercise sheets

Basic literature
• Hull (2005): Options, Futures, & Other Derivatives, Prentice Hall, 6th Edition

Complementary literature
**Course: Investments**

**Lecturers:** Marliese Uhrig-Homburg  
**Credit points (CP):** 5  
**Hours per week:** 2/1  
**Term:** Sommersemester  
**Level:** 3  
**Teaching language:** Deutsch  
**Part of the modules:** Applied Finance [IW3WWFIN0] (S. 39), Financial Economics [IW3WWFIN1] (S. 41), Financial Markets [IW3WWFIN3] (S. 43)

**Learning Control / Examinations**
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. By submitting the exercises (according to Section 4(2), 3 of the examination regulation) up to 4 bonus points can be acquired.

**Prerequisites**
None.

**Conditions**
None.

**Learning Outcomes**
The objective of this course is to become familiar with the basics of investment decisions on stock, bond, and derivatives markets. For that, basic economic concepts and models are discussed and applied on introductory level. Interlinkages between markets, different decision making concepts and models are demonstrated.

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

**Complementary literature**
Course: Seminar in Financial Engineering

Lecturers: Marliese Uhrig-Homburg
Credit points (CP): 3  
Hours per week: 2
Term: Wintersemester  
Level: 4
Teaching language: Deutsch
Part of the modules: Applied Finance [IW3WFFIN0] (S. 39), Financial Markets [IW3WFFIN3] (S. 43)

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 of the Prüfungsordnung für Informationswirtschaft in form of an examination of the written seminar thesis, its presentation, class participation, and possible further tasks.

Prerequisites
None.

Conditions
None.

Learning Outcomes
Learn to work independently with scientific articles and to become familiar with scientific writing. Furthermore, presentation and discussion skills are developed during the seminar class sessions.

Content
Changing current topics complementing the lectures’ contents.

Media
Aktuelle wissenschaftliche Artikel.

Basic literature
wird jeweils zu den einzelnen Seminarthemen angegeben

Complementary literature
Über die beim Seminar angegebene Einstiegliteratur hinaus ist eigenständige Literaturrecherche erforderlich.
Course: Bachelor Seminar in Enterprise Information Systems  

Course key: [BSemBI]

Lecturers: Andreas Oberweis
Credit points (CP): 2  Hours per week: 2
Term: Winter-/Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 of the examination regulation of the Bachelor of Science programme in Information Engineering and Management in form of an examination of the a presentation of the seminar topic and of the written abstract of the seminar topic. The final mark is based on the examination of the written abstract but can be upgraded or downgraded according to the quality of the presentation.

Prerequisites
- Prior attendance of a lecture in the topic of the seminar is precondition.

Conditions
None.

Learning Outcomes
Students are able to
- do literature search based on a given topic: identify relevant literature, find, assess and evaluate this literature.
- give presentations in a scientific context in front of an auditorium. These techniques are presented and learn during the seminar.
- present results of the research in form of a written abstract generally found in scientific publications.

Content
The bachelor seminar intensifies and extends specific topics which are discussed within corresponding lectures. The actual topics are changing each semester. Knowledge of these lecture topics is a precondition.

The bachelor seminar introduces the process of scientific work. Students will write an abstract about a chosen scientific topic. First, a thorough literature search to collect knowledge on this subject is necessary. The abstract is written in the style of the department which is comparable with the style of a publisher.

Basic literature
Literature will be given individually in the specific seminar.
Course: Computing Lab Information Systems  
Course key: [PraBI]

Lecturers: Andreas Oberweis, Detlef Seese, Wolffried Stucky, Rudi Studer

Credit points (CP): 5  
Hours per week: 2

Term: Winter-/Sommersemester  
Level: 3

Teaching language: Deutsch

Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations

The assessment of this course are practical work, presentations and a written thesis according to §4(2), 3 of the examination regulation. Practical work, presentations and a written thesis are weighted according to the course.

Prerequisites

None.

Conditions

None.

Learning Outcomes

Students are able to

• implement a prototype at the computer based on the given topic.

• write the thesis with a minimal learning curve by using format requirements such as those recommended by well-known publishers.

• give presentations in a scientific context in front of an auditorium. These techniques are presented and learn during the course.

• present results of the research in written form generally found in scientific publications.

Content

The lab intensifies and extends specific topics which are discussed within corresponding lectures. Knowledge of these lecture topics is an advantage but not a precondition.

Media

Slides, Access to internet resources

Basic literature

Literature will be given individually.

Remarks

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 http://www.aifb.uni-karlsruhe.de/Lehre
Course: Seminar in Software Engineering

Lecturers: Walter F. Tichy, Ralf Reussner, Gregor Snelting
Credit points (CP): 3  Hours per week: 2
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Design and Implementation of Complex Systems [IW3INCS0] (S. 27)

Learning Control / Examinations

Prerequisites
None.

Conditions
None.

Learning Outcomes

Content
Course: Seminar in Enterprise Information Systems  
Course key: [SemAIFB1]

Lecturers: Rudi Studer, Andreas Oberweis, Wolffried Stucky, Thomas Wolf, Ralf Kneuper
Credit points (CP): 4  Hours per week: 2
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Business Process Engineering [IW3INGP0] (S. 28)

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 of the examination regulation of the Bachelor of Science programme in Information Engineering and Management in form of an examination of the written seminar thesis and a presentation. The final mark is based on the examination of the written seminar thesis but can be upgraded or downgraded according to the quality of the presentation.

Prerequisites
See corresponding module information.

Conditions
None.

Learning Outcomes
Students are able to
  • do literature search based on a given topic: identify relevant literature, find, assess and evaluate this literature.
  • write the seminar thesis (and later the Bachelor-/Masterthesis) with a minimal learning curve by using format requirements such as those recommended by well-known publishers.
  • give presentations in a scientific context in front of an auditorium. These techniques are presented and learned during the seminar.
  • present results of the research in written form generally found in scientific publications.

Content
The seminar intensifies and extends specific topics which are discussed within corresponding lectures. Knowledge of these lecture topics is an advantage but not a precondition.
Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at  http://www.aifb.uni-karlsruhe.de/Lehre

Basic literature
Literature will be given individually in the specific seminar.
Course: Seminar Knowledge Management

Lecturers: Rudi Studer
Credit points (CP): 4  Hours per week: 2
Term: Wintersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
The assessment will be an "Erfolgskontrolle anderer Art", based on §4, 2,3 Prüfungsordnung Informationswirtschaft, usually a talk and a written seminar paper.

Prerequisites
The mandatory lectures of the module are a prerequisite.

Conditions
None.

Learning Outcomes
The students will learn to perform literature searches on current topics in computer science as well as preparing and presenting the contents of scientific publications.

During the work on the seminar topics the master students will deepen their skills to autonomously comprehend current scientific knowledge and to convey it to others through oral presentations and written summaries.

Through active participation in the seminar, students acquire skills in critical appraisal of research topics and in oral and written presentation of independently developed research content.

Content
Each year, the seminar will cover topics from a different selected subfield of knowledge management, e.g.:

- Ontology-based knowledge management,
- Information Retrieval and Text Mining,
- Data Mining,
- Personal Knowledge Management,
- Case Based Reasoning (CBR),
- Collaboration and Social Computing.

Media
Slides.

Basic literature

Complementary literature
None.

Remarks
The number of students is limited. Students have to observe the designated registration process.
Course: Seminar in Industrial Production

Lecturers: Frank Schultmann, Magnus Fröhling, Michael Hiete
Credit points (CP): 4  Hours per week: 2
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Industrial Production [IW3WWPRO0] (S. 48)

Learning Control / Examinations
Prerequisites
None.
Conditions
None.
Learning Outcomes
Content
Course: Seminar Information Engineering and Management  Course key: [SemIW]

Lecturers: Christof Weinhardt
Credit points (CP): 4  Hours per week: 2
Term: Winter-/Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: eBusiness Management [IW3WWEBM0] (S. 35), Supply Chain Management [IW3WWEBM1] (S. 37), eFinance: Information Engineering and Management in Finance [IW3WWEBM2] (S. 38)

Learning Control / Examinations
The student is evaluated based on the written work, a presentation of the results in front of an audience and his contribution to the discussion.

Prerequisites
See corresponding module information.

Conditions
Business Engineering/Economics Engineering: Preferably at least one module offered by the institute should have been chosen before attending this seminar.

Learning Outcomes
The student should be able to do a literature review based on a predefined topic in the context of information engineering and management. The approach comprises the identification of relevant literature according to the topic and an analysis as well as an evaluation of the methods presented in the literature. The student learns to present his results in a paper and in front of an audience on a academic level. This process gives him the knowledge and practice for further research work like a master thesis or a doctoral thesis.

Content
In the seminar the student should learn to apply the research methods to a predefined topic area. The topics are based on research questions in Information Engineering and Management across different industry sectors. This problem analysis requires an interdisciplinary examination.

Media
• Powerpoint,
• eLearning Platform Ilias
• Software Tools, if necessary

Basic literature
The student will receive the necessary literature for his research topic.

Remarks
• Students from Bachelor and Master Course can visit the seminar. The research topic as well as the evaluation of the work and the presentation will have a different focus between Bachelor and Master Course.
• All the seminars offered at the chair of Prof. Dr. Weinhardt can be chosen. The current topics of the seminars are available at the following homepage: http://www.im.uni-karlsruhe.de/lehre.

Modulhandbuch: Stand 24.08.2009  Information Engineering and Management (B.Sc.) ER 2005
Course: Seminar in Experimental Economics

Lecturers: Siegfried Berninghaus

Credit points (CP): 4  Hours per week: 2

Term: Winter-/Sommersemester  Level: 4

Teaching language: Deutsch

Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45)

Learning Control / Examinations

Term paper and presentation.

Prerequisites

See corresponding module information.

A course in the field of Game Theory should be attended beforehand.

Conditions

None.

Learning Outcomes

The seminar wants to deepen the methods of scientific work. Students shall learn to discuss critical the latest research results in Experimental Economics.

Students learn the technical basics of presentation and to argument scientifically. Also rethoric skills shall be amplified.

Content

The seminar's topic will be announced before the beginning of each semester on the internet (http://www.wior.uni-karlsruhe.de/LS_Berninghaus/Studium/).

Media

Slides.

Basic literature

Will be announced at the end of the recess period.
Course: Seminar in Game and Decision Theory

Course key: [SemWIOR4]

Lecturers: Siegfried Berninghaus
Credit points (CP): 4  Hours per week: 2
Term: Winter-/Sommersemester  Level: 4
Teaching language: Deutsch
Part of the modules: Strategy and Managerial Economics [IW3WWORG0] (S. 45)

Learning Control / Examinations
Term paper and presentation.

Prerequisites
Completion of all 1st an 2nd year modules of the Bachelor Program.
See corresponding module information.

Conditions
None.

Learning Outcomes
The seminar wants to deepen the methods of scientific work. Students shall learn to discuss critical the latest research results in game theory. Procurement of SQs: Students learn the technical basics of presentation and to argument scientifically. Also rethoric skills shall be amplified.

Content
The seminar’s topic will be announced before the beginning of each semester on the internet (http://www.wior.uni- karlsruhe.de/LS_Berninghaus/Studium/).

Media
Slides.

Basic literature
Will be announced at the end of the recess period.
Course: Undergraduate Seminar Information Systems

Lecturers: Klemens Böhm
Credit points (CP): 3  Hours per week: 2
Term: Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Information and Knowledge Systems [IW3INISW0] (S. 30)

Learning Control / Examinations
The assessment involves writing a seminar paper and an oral presentation as a graded “Erfolgskontrolle anderer Art” according to §4, Abs. 2 of the Prüfungsordnung. The final grade for the seminar will be the grade for the written paper which can be increased or decreased by up to two grade points (“Notenstufen”) according to the performance of the oral presentation.

Prerequisites
Lectures held at the Information Systems Group related to the current topic of the seminar are strongly recommended.

Conditions
None.

Learning Outcomes
Independent preparation and presentation of a seminar topic from the field of information systems adhering to scientific standards.

Content
The Information Systems Group offers every summer semester one undergraduate seminar covering selected topics from the area of information systems (every undergraduate seminar at the “Lehrstuhl für Systeme der Informationsverwaltung” counts as “Undergraduate Seminar Information Systems”). For example, the topics can be in the following areas peer-to-peer networks, database systems, data mining, sensor networks and workflow-management systems. Details will be announced each semester (announcements at the notice boards of the institute and at the homepage of the Information Systems Group).

Media
Slides.

Basic literature
Will be announced for every seminar.

Complementary literature
Literature from lectures concerning the seminar topic.
Course: Seminar in Law

Lecturers: Thomas Dreier, Peter Sester, Indra Spiecker genannt Döhmann
Credit points (CP): 4  Hours per week: 2
Term: Winter-/Sommersemester  Level: 3
Teaching language: Deutsch
Part of the modules: Intellectual Property and Data Protection Law [IW3INJURA] (S. 49)

Learning Control / Examinations
Written paper and oral presentation (§4, Abs. 2, 3 of the SPO).

Prerequisites
None.

Conditions
None.

Learning Outcomes
It is the goal of the seminar to enable students to independent scientific research regarding legal issues in the area of information management and engineering. The seminar covers legal issues of information law and commercial law, from internet law, the law of intellectual property, competition law and data protection law to contract law. The subjects to be discussed comprise issues of national, European and international law. Written papers shall also discuss the information technology issues and economic questions related to the legal problem at issue.

Content
The seminar covers legal issues of information law, from internet law, the law of intellectual property, competition law and data protection law to contract law. The subjects to be discussed comprise issues of national, European and international law. Each seminar focuses on a different set of issues. Written papers shall also discuss the information technology issues and economic questions related to the legal problem at issue. The current topics will be announced before start of term.

Students can participate in all seminars offered by the ZAR/IIR (however, students can participate in seminars of the master study cours, seminars in cooperation with the University of Freiburg and other specially marked seminars if special permission has been granted).

Basic literature
Tba in the lecture.
Course: Algorithm Engineering  

**Lecturers:** Peter Sanders, Dorothea Wagner  
**Credit points (CP):** 4  
**Hours per week:** 2  
**Term:** Winter-/Sommersemester  
**Level:** 4  
**Teaching language:** Deutsch  
**Part of the modules:** Algorithm Design [IW3INALG0] (S. 26)

**Learning Control / Examinations**  
Assessment will consist of an oral exam (20 min) following §4, Abs. 2, 2 of the Prüfungsordnung für Informationswirtschaft.

**Prerequisites**  
Lecture Algorithmentechnik

**Conditions**  
None.

**Learning Outcomes**  
The students come to know the methodology of algorithm engineering. Moreover, examples of well done algorithm engineering are presented.

**Content**  
- What is algorithm engineering, why is it interesting, ...?  
- Realistic models of machines and applications  
- Practice-oriented design of algorithms  
- Implementation techniques  
- Experimental methods  
- Analysis of measured data

The above skills are taught using concrete examples. In the past the following topics from the area of fundamental algorithms and data structures have been used for example:

- linked lists without special cases  
- Sorting: parallel, external, superscalar,...  
- Priority queues (chache efficiency,...)  
- Search trees for integer keys  
- Full-text indexing  
- Graph algorithms: minimum spanning trees (external,...), route planning

The best practical and theoretical techniques known are considered. In most cases, these techniques are very different from the methods taught in a beginner's course.

**Media**  
Slides, Scriptum, papers, source codes

**Complementary literature**  
- K. Mehlhorn, P. Sanders, Algorithms and Data Structures - The Basic Toolbox, Springer 2008

**Remarks**  
The lecture will be offered again in the winter term 09/10.
Course: Practical Course Information Services in Networks

Lecturers: Hartmut Schmeck, Stefan Tai, Wilfried Juling, Walter F. Tichy, Rudi Studer, Hannes Hartenstein

Credit points (CP): 5  Hours per week: 4

Term: Winter-/Sommersemester  Level: 3

Teaching language: Deutsch

Part of the modules: Information Services in Networks [IW3INIDL0] (S. 29)

Learning Control / Examinations

Prerequisites
None.

Conditions
the advanced lab may offered by any of the lecturers participating in this module

Learning Outcomes

Students can,

• carry out a literature search based on a given topic, and then identify, find, evaluate and analyze the relevant literature.

• produce their seminar work (and later the bachelor-/ masters thesis) without much initial delay for familiarizing with the topic, while obeying format requirements, like the ones provided by publishers in the publication of documents.

• devise presentations as part of a scientific context. For that techniques will be presented which allow the preparation and presentation of the content to be presented in a manner that is adequate for the audience.

• present the results of the research in written form in a manner that is generally used in scientific publications.

Content

The seminar deals with specific topics that were partly mentioned in the respective lecture, and deepens them. A previous visit to the respective lecture is helpful, but not a prerequisite for attendance.
Course: Seminar Information Services in Networks  
Course key: [xIDLs]

Lecturers: Hartmut Schmeck, Stefan Tai, Wilfried Juling, Rudi Studer, Hannes Hartenstein, Walter F. Tichy
Credit points (CP): 4  Hours per week: 2  
Term: Winter-/Sommersemester  Level: 3  
Teaching language: Deutsch
Part of the modules: Information Services in Networks [IW3INIDLO] (S. 29)

Learning Control / Examinations

Prerequisites
None.

Conditions
None.

Learning Outcomes
Students can,
• carry out a literature search based on a given topic, and then identify, find, evaluate and analyze the relevant literature.
• produce their seminar work (and later the bachelor- / masters thesis) without much initial delay for familiarizing with the topic, while obeying format requirements, like the ones provided by publishers in the publication of documents.
• devise presentations as part of a scientific context. For that techniques will be presented which allow the preparation and presentation of the content to be presented in a manner that is adequate for the audience.
• present the results of the research in written form in a manner that is generally used in scientific publications.

Content
The seminar deals with specific topics that were partly mentioned in the respective lecture, and deepens them. A previous visit to the respective lecture is helpful, but not a prerequisite for attendance.
**Module: Infrastruktur**

**Subject:** Informatics (Specialization)

**Module coordination:** Martina Zitterbart

**Credit points (CP):** 21

### Learning Control / Examinations

#### Prerequisites
None.

#### Conditions
None.

#### Learning Outcomes

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Neubekanntmachung der Studien- und Prüfungsordnung der Universität Karlsruhe (TH) für den Bachelorstudiengang Informationswirtschaft

in der Fassung vom 15. August 2008


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I. Allgemeine Bestimmungen

§ 1 Geltungsbereich, Zweck der Prüfung
(1) Diese Bachelorprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Bachelorstudiengang Informationswirtschaft an der Universität Karlsruhe (TH).

(2) Die Bachelorprüfung (§ 17 – 20) bildet den berufsbefähigenden Abschluss dieses Studiengangs, der gemeinsam von der Fakultät für Informatik und der Fakultät für Wirtschaftswissenschaften an der Universität Karlsruhe (TH) angeboten wird. Durch die Bachelorprüfung soll festgestellt werden, ob die Kandidatin bzw. der Kandidat die für den Übergang in die Berufspraxis grundlegenden wissenschaftlichen Fachkenntnisse besitzt und die Zusammenhänge des Faches Informationswirtschaft überblickt.

§ 2 Akademischer Grad
Aufgrund der bestandenen Bachelorprüfung wird der akademische Grad „Bachelor of Science“ (abgekürzt: „B.Sc.”) für den Bachelorstudiengang Informationswirtschaft (englischsprachig: for the Degree Programme Information Engineering and Management) verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Umfang des Lehrangebots
(1) Die Regelstudienzeit beträgt sechs Semester. Sie umfasst ein Betriebspraktikum, Prüfungen und die Bachelorarbeit.

(2) Die im Studium zu absolvierenden Lehrinhalte sind in Module gegliedert, die jeweils aus einer Lehrveranstaltung oder mehreren, thematisch und zeitlich aufeinander bezogenen Lehrveranstaltungen bestehen. Art, Umfang und Zuordnung der Module zu einem Fach sowie die Möglichkeiten, Module untereinander zu kombinieren, beschreibt der Studienplan. Die Fächer und ihr Umfang werden in § 17 definiert.


(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studienleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 182 Leistungspunkte. Die Semester 1 bis 4 umfassen 119 Leistungspunkte, die Semester 5 bis 6 umfassen 63 Leistungspunkte.

(5) Die Verteilung der Leistungspunkte im Studienplan auf die Semester hat in der Regel gleichmäßig zu erfolgen.

(6) Lehrveranstaltungen können auch in englischer Sprache angeboten werden.

§ 4 Aufbau der Prüfungen

(2) Erfolgskontrollen sind:
   1. schriftliche Prüfungen,
   2. mündliche Prüfungen oder
   3. Erfolgskontrollen anderer Art.
Erfolgskontrollen anderer Art sind z.B. Vorträge, Marktstudien, Projekte, Fallstudien, Experimente, schriftliche Arbeiten, Berichte, Seminararbeiten und Klausuren, sofern sie nicht als schriftliche oder mündliche Prüfung in der Modul- oder Lehrveranstaltungsbeschreibung im Studienplan ausgewiesen sind.

(3) Mindestens 50 % einer Modulprüfung sind in Form von schriftlichen oder mündlichen Prüfungen (§ 4 Abs. 2, Nr. 1 und 2) abzulegen, die restlichen Prüfungen erfolgen durch Erfolgskontrollen anderer Art (§ 4 Abs. 2, Nr. 3).

§ 5 Prüfungsausschuss


(3) Der Prüfungsausschuss regelt die Auslegung und die Umsetzung der Prüfungsordnung in die Prüfungspraxis der Fakultäten. Er achtet darauf, dass die Bestimmungen der Prüfungsordnung eingehalten werden. Er berichtet regelmäßig den Fakultätsräten über die Entwicklung der Prüfungen und Studienzeiten sowie über die Verteilung der Fach- und Gesamtnoten und gibt Anregungen zur Reform des Studienplans und der Prüfungsordnung.


(5) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses eine fachlich zuständige und von der betroffenen Fakultät zu nennende Professorin, Juniortprofessorin, Hochschul- oder Privatdozentin bzw. ein fachlich zuständiger Professor, Juniortprofessor, Hochschul- oder Privatdozent hinzuzuziehen. Sie bzw. er hat in diesem Punkt Stimmrecht.

§ 6 Prüferinnen, Prüfer und Beisitzende

(1) Der Prüfungsausschuss bestellt die Prüferinnen, die Prüfer und die Beisitzenden. Er kann die Bestellung der bzw. dem Vorsitzenden übertragen.

(2) Zur Abnahme von Erfolgskontrollen (§ 4 Abs. 2) sind vorrangig Professorinnen, Juniortprofessorinnen, Hochschul- und Privatdozentinnen bzw. Professoren, Juniortprofessoren, Hochschul- und Privatdozenten zu bestellen.

(3) Soweit Lehrveranstaltungen von anderen als den unter § 6 Abs. 2 genannten Personen durchgeführt werden, sollen diese zur Prüferin bzw. zum Prüfer bestellt werden, wenn die jeweilige Fakultät ihr bzw. ihm eine diesbezügliche Prüfungsbefugnis erteilt hat.
(4) Zum Beisitzenden darf nur bestellt werden, wer einen akademischen Abschluss in einem Studiengang der Informationswirtschaft, Informatik, Rechtswissenschaften, Wirtschaftswissenschaften oder einen gleichwertigen akademischen Abschluss erworben hat.

§ 7 Anmeldung und Zulassung zu den Prüfungen

(1) Um zu schriftlichen und/oder mündlichen Prüfungen (§ 4 Abs. 2, Nr. 1 und 2) in einem bestimmten Modul zugelassen zu werden, muss die Studentin bzw. der Student vor der ersten schriftlichen oder mündlichen Prüfung in diesem Modul beim Studienbüro eine bindende Erklärung über die Wahl des betreffenden Moduls und dessen Zuordnung zu einem Fach, wenn diese Wahlmöglichkeit besteht, abgeben. Darüber hinaus muss sich die Studentin bzw. der Student für jede einzelne Lehrveranstaltungsprüfung, die in Form einer schriftlichen oder mündlichen Prüfung (§ 4 Abs. 2, Nr. 1 und 2) durchgeführt wird, beim Studienbüro anmelden. Dies gilt auch für die Zulassung zur Bachelorarbeit.

(2) Die Zulassung darf nur abgelehnt werden, wenn
1. die Kandidatin bzw. der Kandidat in einem mit der Informationswirtschaft vergleichbaren oder einem verwandten Studiengang bereits eine Diplomvorprüfung, Diplomprüfung, Bachelor- oder Masterprüfung nicht bestanden hat, sich in einem Prüfungsverfahren befindet oder den Prüfungsanspruch in einem solchen Studiengang verloren hat oder
2. die in § 18 genannte Voraussetzung nicht erfüllt ist.

In Zweifelsfällen entscheidet der Prüfungsausschuss.

§ 8 Durchführung von Prüfungen und Erfolgskontrollen

(1) Erfolgskontrollen werden in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach durchgeführt.


(3) Bei unvertretbar hohem Prüfungsaufwand kann eine schriftlich durchzuführende Prüfung auch mündlich oder eine mündlich durchzuführende Prüfung auch schriftlich abgenommen werden. Diese Änderung muss mindestens sechs Wochen vor der Prüfung bekannt gegeben werden.

(4) Macht eine Kandidatin bzw. ein Kandidat glaubhaft, dass sie bzw. er wegen länger andauernder oder ständiger körperlicher Behinderung nicht in der Lage ist, die Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen Form abzulegen, kann der zuständige Prüfungsausschuss – in dringenden Angelegenheiten, deren Erledigung nicht bis zu einer Sitzung des Ausschusses aufgeschoben werden kann, dessen Vorsitzende bzw. Vorsitzende – gestatten, Erfolgskontrollen in einer anderen Form zu erbringen.

(5) Bei Lehrveranstaltungen in englischer Sprache können mit Zustimmung der Kandidatin bzw. des Kandidaten die entsprechenden Erfolgskontrollen in englischer Sprache abgenommen werden.


Schriftliche Arbeiten im Rahmen einer Erfolgskontrolle anderer Art haben dabei die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Trägt die Arbeit diese Erklärung nicht, wird diese Arbeit nicht angenommen. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

Bei mündlich durchgeführten Erfolgskontrollen anderer Art muss neben der Prüferin bzw. dem Prüfer eine Beisitzerin oder ein Beisitzer anwesend sein, die zusätzlich zur Prüferin bzw. zum Prüfer die Protokolle zeichnet.

§ 9 Bewertung von Prüfungen und Erfolgskontrollen

Das Ergebnis einer Erfolgskontrolle wird von den jeweiligen Prüferinnen bzw. Prüfern in Form einer Note festgesetzt.

Im Bachelorzeugnis dürfen nur folgende Noten verwendet werden:

1 = „sehr gut“ (very good) für eine hervorragende Leistung;
2 = „gut“ (good) für eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt;
3 = „befriedigend“ (satisfactory) für eine Leistung, die durchschnittlichen Anforderungen entspricht;
4 = „ausreichend“ (sufficient) für eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt;
5 = „nicht ausreichend“ (failed) für eine Leistung, die wegen erheblicher Mängel den Anforderungen nicht mehr genügt.
Für die Bachelorarbeit und die Lehrveranstaltungsprüfungen sind zur differenzierten Bewertung nur folgende Noten zugelassen:

1.0, 1.3 (sehr gut)
1.7, 2.0, 2.3 (gut)
2.7, 3.0, 3.3 (befriedigend)
3.7, 4.0 (ausreichend) und
4.7, 5.0 (nicht ausreichend)

Diese Noten müssen in den Protokollen und in den Anlagen (Transcript of Records und Diploma Supplement) verwendet werden.

(3) Für Leistungsnachweise kann im Studienplan die Benotung mit „bestanden“ (passed) oder „nicht bestanden“ (failed) vorgesehen werden.

(4) Bei der Bildung der gewichteten Durchschnitte der Fachnoten, Modulnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

(5) Jedes Modul, jede Lehrveranstaltung und jede Erfolgskontrolle darf jeweils nur einmal angerechnet werden.

(6) Erfolgskontrollen können in Form von Leistungsnachweisen dokumentiert werden. Leistungsnachweise dürfen in Lehrveranstaltungsprüfungen oder Modulprüfungen nur eingerechnet werden, wenn die Benotung nicht nach § 9 Abs. 3 erfolgt ist. Die durch Leistungsnachweise zu dokumentierenden Erfolgskontrollen und die daran geknüpften Bedingungen werden im Studienplan festgelegt.

(7) Eine Lehrveranstaltungsprüfung ist bestanden, wenn die Note mindestens „ausreichend“ (4.0) ist.


(9) Die Ergebnisse der Modulprüfungen und der Lehrveranstaltungsprüfungen, der Leistungsnachweise, der Bachelorarbeit und die Bescheinigung über das abgeleistete Betriebspraktikum sowie die erworbenen Leistungspunkte werden beim Studienbüro der Universität erfasst.

(10) Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein. Eine Fachprüfung ist bestanden, wenn die für das Fach erforderliche Anzahl von Leistungspunkten nachgewiesen wird.

(11) Innerhalb der Regelstudienzeit, einschließlich der Urlaubssemester für das Studium an einer ausländischen Hochschule (Regelprüfungszeit), können in einem Fach auch mehr Leistungspunkte erwogen werden als für das Bestehen der Fachprüfung erforderlich sind. In diesem Fall werden bei der Festlegung der Fachnote nur die Modulnoten berücksichtigt, die unter Abdeckung der erforderlichen Leistungspunkte die beste Fachnote ergeben.

(12) Die Gesamtnote der Bachelorprüfung, die Fachnoten und die Modulnoten lauten:

bei einem Durchschnitt bis 1.5 „sehr gut“ (very good),
bei einem Durchschnitt über 1.5 bis 2.5 „gut“ (good),
bei einem Durchschnitt über 2.5 bis 3.5 „befriedigend“ (satisfactory),
bei einem Durchschnitt über 3.5 bis 4.0 „ausreichend“ (sufficient).
Zusätzlich zu den Noten nach § 9 Abs. 2 werden ECTS-Noten für Fachprüfungen, Modulprüfungen und für die Bachelorprüfung nach folgender Skala vergeben:

ECTS-Note – Quote – Definition
A – 10 – gehört zu den besten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben,
B – 25 – gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben,
C – 30 – gehört zu den nächsten 30 % der Studierenden, die die Erfolgskontrolle bestanden haben,
D – 25 – gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben,
E – 10 – gehört zu den letzten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben,
FX – nicht bestanden (failed) – es sind Verbesserungen erforderlich, bevor die Leistungen anerkannt werden,
F – nicht bestanden (failed) – es sind erhebliche Verbesserungen erforderlich.

Die Quote ist als der Prozentsatz der erfolgreichen Studentinnen bzw. Studenten definiert, die diese Note in der Regel erhalten. Dabei ist von einer mindestens fünfjährigen Datenbasis über mindestens 30 Studentinnen bzw. Studenten auszugehen. Für die Ermittlung der Notenverteilungen, die für die ECTS-Noten erforderlich sind, ist das Studienbüro der Universität zuständig.


§ 10 Erlöschen des Prüfungsanspruchs, Orientierungsprüfungen, Wiederholung von Prüfungen und Erfolgskontrollen


(3) Kandidatinnen bzw. Kandidaten können eine nicht bestandene mündliche Prüfung (§ 4 Abs. 2, Nr. 2) einmal wiederholen.


(5) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Abs. 2, Nr. 3) wird im Studienplan geregelt.

bzw. der Rektor. Über weitere Anträge auf Zweitwiederholung entscheidet nach Stellungnahme des Prüfungsausschusses die Rektorin bzw. der Rektor. § 10 Abs. 2, Satz 2 und 3 gilt entsprechend.

(7) Hat eine Kandidatin bzw. ein Kandidat eine Erfolgskontrolle nicht bestanden, so sind ihr bzw. ihm Umfang und Fristen der Wiederholung der Erfolgskontrolle in geeigneter Weise bekannt zu machen.

(8) Die Wiederholung einer bestandenen Erfolgskontrolle ist nicht zulässig.

(9) Eine Fachprüfung ist endgültig nicht bestanden, wenn mindestens ein Modul des Faches endgültig nicht bestanden ist.


(11) Ist gemäß § 34 Abs. 2, Satz 3 LHG die Bachelorprüfung bis zum Beginn der Vorlesungszeit des zehnten Fachsemesters einschließlich etwaiger Wiederholungen nicht vollständig abgelegt, so erlischt der Prüfungsanspruch im Studiengang, es sei denn, dass die Studentin oder der Student die Fristüberschreitung nicht zu vertreten hat. Die Entscheidung darüber trifft der Prüfungsausschuss.

§ 11 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß


(3) Versucht die Kandidatin bzw. der Kandidat, das Ergebnis einer mündlichen oder schriftlichen Prüfung (§ 4 Abs. 2, Nr. 1 und 2) durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Prüfung als mit „nicht ausreichend“ (5.0) bewertet. Eine Kandidatin bzw. ein Kandidat, die bzw. der den ordnungsgemäßen Ablauf der Prüfung stört, kann von der jeweiligen Prüferin bzw. dem jeweiligen Prüfer oder Aufsichtsführenden von der Fortsetzung der Prüfung ausgeschlossen werden; in diesem Fall gilt die betreffende Prüfung als mit „nicht ausreichend“ (5.0) bewertet. In schwerwiegenderen Fällen kann der Prüfungsausschuss die Kandidatin bzw. den Kandidaten von der Erbringung weiterer Prüfungen ausschließen. Die Sätze 1–3 gelten für Erfolgskontrollen anderer Art (§ 4 Abs. 2, Nr. 3) entsprechend.


§ 12 Mutterschutz

Werdende Mütter müssen in den letzten sechs Wochen vor der Entbindung und bis zum Ablauf von acht Wochen nach der Entbindung nicht an Erfolgskontrollen teilnehmen. § 6 Abs. 1 Satz 2 des Mutterschutzgesetzes (Regelung für Früh- und Mehrlingsgeburten) gilt entsprechend. Anträge
auf Inanspruchnahme des Mutterschutzes sind an den Prüfungsausschuss zu richten. Wird der Mutterschutz in Anspruch genommen, so verlängern sich alle Fristen dieser Prüfungsordnung entsprechend.

§ 13 Anerkennung von Studienzeiten, Studienleistungen und Prüfungsleistungen

(1) Studienzeiten, Studienleistungen und Prüfungsleistungen im Bachelorstudiengang Informatikswirtschaft an einer Universität oder einer gleichgestellten Hochschule in Deutschland werden angerechnet, sofern Gleichwertigkeit nachgewiesen wird. Studienzeiten, Studienleistungen und Prüfungsleistungen in anderen Studiengängen werden anerkannt, soweit die Gleichwertigkeit festgestellt ist. Die Anerkennung von Teilen der Bachelorprüfung wird in der Regel versagt, wenn die Anerkennung von mehr als der Hälfte der Leistungspunkte oder mehr als der Hälfte der Modulprüfungen oder die Anerkennung der Bachelorarbeit beantragt worden ist.

(2) Für Studienzeiten, Studienleistungen und Prüfungsleistungen in staatlich anerkannten Fernstudien gilt § 13 Abs. 1 entsprechend. Das gleiche gilt außerdem auch für Studienzeiten, Studienleistungen und Prüfungsleistungen in anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufsausbildungsinstituten sowie an Fach- und Ingenieurschulen.


(4) Der Prüfungsausschuss entscheidet in Abhängigkeit von Art und Umfang der anzurechnenden Studien- und Prüfungsleistungen über die Einstufung in ein höheres Fachsemester.


(6) Bei Vorliegen der Voraussetzungen nach § 13 Abs. 1 – 4 besteht ein Rechtsanspruch auf Anrechnung. Die Anrechnung von Studienzeiten, Studienleistungen und Prüfungsleistungen, die in Deutschland erbracht wurden, erfolgt von Amts wegen. Die Studierenden haben die für die Anrechnung erforderlichen Unterlagen vorzulegen.

(7) Erbringt eine Studentin bzw. ein Student Studienleistungen an einer ausländischen Universität, soll die Gleichwertigkeit vorab durch einen Studienvertrag nach den ECTS-Richtlinien festgestellt und nach diesem verfahren werden.

§ 14 Bachelorarbeit


(2) Die Bachelorarbeit kann von jeder Prüferin bzw. jedem Prüfer nach § 6 Abs. 2 vergeben und betreut werden. Soll die Bachelorarbeit außerhalb der beiden nach § 1 Abs. 2, Satz 1 beteiligten Fakultäten angefordert werden, so bedarf dies der Genehmigung des Prüfungsausschusses.
Der Kandidatin bzw. dem Kandidaten ist Gelegenheit zu geben, für das Thema Vorschläge zu machen. Die Bachelorarbeit kann auch in Form einer Gruppenarbeit zugelassen werden, wenn der als Prüfungsleistung zu bewertende Beitrag der einzelnen Kandidatin bzw. des einzelnen Kandidaten aufgrund objektiver Kriterien, die eine eindeutige Abgrenzung ermöglichen, deutlich unterscheidbar ist und die Anforderung nach § 14 Abs. 1 erfüllt.


(4) Thema, Aufgabenstellung und Umfang der Bachelorarbeit sind von der Betreuerin bzw. dem Betreuer so zu begrenzen, dass sie mit dem in § 14 Abs. 1 festgelegten Arbeitsaufwand bearbeitet werden kann.

(5) Die Bachelorarbeit hat die folgende Erklärung zu tragen: „Ich versichere wahrheitsgemäß, die Arbeit selbstständig angefertigt, alle benutzten Hilfsmittel vollständig und genau angegeben und alles kenntlich gemacht zu haben, was aus Arbeiten anderer unverändert oder mit Abänderungen entnommen wurde.“ Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen.


§ 15 Betriebspraktikum


(2) Die Studentin bzw. der Student setzt sich in eigener Verantwortung mit geeigneten privaten bzw. öffentlichen Einrichtungen in Verbindung, an denen das Praktikum abgeleistet werden kann. Die Studentin bzw. der Student wird dabei von einer Prüferin bzw. einem Prüfer nach § 6 Abs. 2 und einer Firmenbetreuerin bzw. einem Firmenbetreuer betreut.

(3) Am Ende des Betriebspraktikums ist ein kurzer Bericht der Prüferin bzw. dem Prüfer abzugeben und eine Kurzpräsentation der Erfahrungen im Betriebspraktikum zu halten.

(4) Das Betriebspraktikum ist abgeschlossen, wenn eine mindestens sechswöchige Tätigkeit nachgewiesen wird, der Bericht abgegeben und die Kurzpräsentation gehalten wurde. Die Durchführung des Betriebspraktikums ist im Studienplan zu regeln. Das Betriebspraktikum geht nicht in die Gesamtnote ein.
§ 16 Zusatzmodule und Zusatzleistungen

(1) Die Kandidatin bzw. der Kandidat kann sich weiteren Prüfungen in Modulen im Umfang von höchstens 20 Leistungspunkten unterziehen. § 3 und § 4 der Prüfungsordnung bleiben davon unberührt.


(3) Die Kandidatin bzw. der Kandidat hat bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

II. Bachelorprüfung

§ 17 Umfang und Art der Bachelorprüfung

(1) Die Bachelorprüfung besteht aus den Fachprüfungen nach § 17 Abs. 2 und § 17 Abs. 3 sowie der Bachelorarbeit (§ 14).

(2) In den ersten beiden Studienjahren sind Fachprüfungen aus folgenden Fächern durch den Nachweis von Leistungspunkten in einem oder mehreren Modulen abzulegen:

1. Betriebswirtschaftslehre: im Umfang von 15 Leistungspunkten,
2. Volkswirtschaftslehre: im Umfang von 5 Leistungspunkten,
3. Informatik: im Umfang von 38 Leistungspunkten,
4. Mathematik: im Umfang von 15 Leistungspunkten,
5. Operations Research: im Umfang von 9 Leistungspunkten,
6. Statistik: im Umfang von 10 Leistungspunkten,

Die Module, die ihnen zugeordneten Leistungspunkte und die Zuordnung der Module zu den Fächern sind im Studienplan festgelegt. Zur entsprechenden Modulprüfung kann nur zugelassen werden, wer die Anforderungen nach § 7 erfüllt.


(4) Im dritten Studienjahr ist als eine weitere Prüfungsleistung eine Bachelorarbeit gemäß § 14 anzufertigen.
§ 18 Leistungsnachweise für die Bachelorprüfung

Voraussetzung für die Anmeldung zur letzten Modulprüfung der Bachelorprüfung ist die Bescheinigung über das erfolgreich abgeleistete Betriebspraktikum nach § 15. In Ausnahmefällen, die die Kandidatin bzw. der Kandidat nicht zu vertreten hat, kann der Prüfungsausschuss die nachträgliche Vorlage dieses Leistungsnachweises genehmigen.

§ 19 Bestehen der Bachelorprüfung, Bildung der Gesamtnote

(1) Die Bachelorprüfung ist bestanden, wenn alle in § 17 genannten Prüfungsleistungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Bachelorprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt. Dabei werden die Noten des dritten Studienjahres (§ 17 Abs. 3) und der Bachelorarbeit jeweils mit dem doppelten Gewicht der Noten der ersten beiden Studienjahre (§ 17 Abs. 2) berücksichtigt.

(3) Hat die Kandidatin bzw. der Kandidat die Bachelorarbeit mit der Note 1.0 und die Bachelorprüfung mit einem Durchschnitt von 1.2 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen.

§ 20 Bachelorzeugnis und Urkunde


(5) Die Bachelorurkunde, das Bachelorzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studienbüro der Universität ausgestellt.
III. Schlussbestimmungen

§ 21 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen

(1) Der Bescheid über die endgültig nicht bestandene Bachelorprüfung wird der Kandidatin bzw. dem Kandidaten durch den Prüfungsausschuss in schriftlicher Form erteilt. Der Bescheid ist mit einer Rechtsbehelfsbelehrung zu versehen.

(2) Hat die Kandidatin bzw. der Kandidat die Bachelorprüfung endgültig nicht bestanden, wird ihr bzw. ihm auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Prüfungsleistungen und deren Noten sowie die zur Prüfung noch fehlenden Prüfungsleistungen enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 22 Ungültigkeit der Bachelorprüfung, Entziehung des Bachelorgrades

(1) Hat die Kandidatin bzw. der Kandidat bei einer Prüfung getäuscht und wird diese Tatsache erst nach der Aushändigung des Zeugnisses bekannt, so kann der Prüfungsausschuss nachträglich die Noten für diejenigen Prüfungsleistungen, bei deren Erbringung die Kandidatin bzw. der Kandidat getäuscht hat, entsprechend berichtigen und die Prüfung ganz oder teilweise für „nicht bestanden“ erklären.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass die Kandidatin bzw. der Kandidat hierüber täuschen wollte, so wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat die Kandidatin bzw. der Kandidat die Zulassung vorsätzlich zu Unrecht erwirkt, so entscheidet der Prüfungsausschuss nach Maßgabe des Landesverwaltungsverfahrensgesetzes in der jeweils gültigen Fassung.

(3) Der Kandidatin bzw. dem Kandidaten ist vor einer Entscheidung nach § 22 Abs. 1 und § 22 Abs. 2, Satz 2 Gelegenheit zur Äußerung zu geben.


(5) Die Entziehung des akademischen Bachelorgrades richtet sich nach den gesetzlichen Bestimmungen.

(6) Eine Entscheidung nach § 22 Abs. 1 oder § 22 Abs. 2, Satz 2 ist nach einer Frist von fünf Jahren ab dem Datum des Prüfungszeugnisses ausgeschlossen.

§ 23 Einsicht in die Prüfungsakten

(1) Innerhalb eines Jahres nach dem Ablegen einer Erfolgskontrolle (§ 4 Abs. 2) ist einer Kandidatin bzw. einem Kandidaten auf Antrag in angemessener Frist Einsicht in die ihn betreffenden Unterlagen dieser Erfolgskontrolle zu gewähren. Die bzw. der Vorsitzende des Prüfungsausschusses bestimmt Ort und Zeit der Einsichtnahme. Kann die Kandidatin bzw. der Kandidat einen festgesetzten Termin zur Einsichtnahme nicht wahrnehmen, muss sie bzw. er dies gegenüber dem Prüfungsausschuss anzeigen und begründen. Der Prüfungsausschuss entscheidet über eine weitere Gelegenheit zur Einsichtnahme.

(2) § 23 Abs. 1 gilt entsprechend für die Einsicht in die Prüfungsakte.

(3) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.
§ 24 In-Kraft-Treten


Karlsruhe, den 12. August 2005

Professor Dr. sc. tech. Horst Hippler
(Rektor)
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