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

Winter term 2010/2011
Long version
17.09.2010

Faculty of Economics and Business Engineering
Fakultät für Informatik

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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.

Semester	Information Engineering and Management (B.Sc.) — Core Programme
Subject	INFO	BA	EC	OR	STAT	MATH	LAW
1	Foundations in Informatics 10 CP	Foun-Dations in BA 8 CP	EC 5 CP			Math I 8 CP	Introduction to Civil Law 4 CP
2	Algorithms I 6 CP			OR 9 CP	Stat 10 CP	Math II 8 CP	
3	Theor. Inform. 7 CP / Applied Inform. 8 CP	BA 8 CP					Commercial Law 9 CP / Constitutional and Administrative Law 6 CP
4	Computer Eng. 6 CP						
	Internship 8 CP						

Semester	Specialization Programme
Subject	INFO	\multicolumn{3}{BA/EC/OR}	\multicolumn{2}{LAW}
5	Modules 18 CP / Seminar* 3 CP	BA-Module 9 CP	Module 9 CP	Seminar* 3 CP	Module 6 CP	Seminar* 3 CP
6	Bachelor Thesis 12 CP					
	180 CP (Core programme+ specialization programme + Bachelor thesis)					

Seminar*: 2 out of 3 Seminars have to be chosen.

Figure 1: Structure of Bachelor Programme in Information Engineering and Management

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 allocation of courses to modules and the curriculum for the first four terms.

ModulID	Course	Hours per week	CP
1st Term			
IW1BWL1	Financial and Management Accounting	2/2	4.0
IW1VWL	Economics I	3/0/2	5.0
IW1MATH1	Mathematics I	4/2/2	8.0
IW1INF1	Basic Notions of Computer Science	2/1/2	5.0
IW1INF1	Programming	2/0/2	5.0
IW1JURA1	Civil Law for Beginners	4/0	4.0
			31.0
2nd Term			
IW1BWL1	Introduction to Information Engineering and Management	2/2	4.0
IW1STAT	Statistics I	4/0/2	5.0
IW1OR	Introduction to Operations Research I	2/2/2	4.5
IW1MATH2	Mathematics II	4/2/2	8.0
IW2INF2	Algorithms I	3/1/2	6.0
IW1JURA2	Advanced Civil Law	2/0	3.0
			30.5
3rd Term			
IW1BWL2	Business Administration and Management Science C	2/0/2	4.0
IW1STAT	Statistics II	4/0/2	5.0
IW1OR	Introduction to Operations Research II	2/2/2	4.5
IW2INF3	Theoretical Foundation of Computer Science	3/1	7.0
IW1INF5	Applied Informatics I	2/1	4.0
IW1JURA2	Commercial and Corporate Law	2/0	3.0
IW1JURA3	Public Law I	2/0	3.0
			30.5
4th Term			
IW1BWL2	Business Administration and Management Science B	2/0/2	4.0
IW1INF5	Applied Informatics II	2/2/2	4.0
IW2INF4	Computer Engineering	3/1/2	6.0
IW1JURA3	Public Law II	2/0	3.0
IW1JURA2	Exercises in Civil Law	2/0	3.0
IW1PRAK	Internship		8.0
			28.0
			120.0

Table 1: Curriculum in the terms 1-4

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

1. module(s) with 18 credits in informatics
2. a module with 9 credits in the subject Business Administration
3. a module with 9 credits in the subject BA/OR/EC,
4. a module with 6 credits in law,
5. two out of the three seminar modules with 3 credits each,
6. and the bachelor thesis with 12 credits.

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 hanbook 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.kit.edu/serviceHinweise.php.

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).

Used abbreviations

LP/CP	Credit Points/ECTS	Leistungspunkte/ECTS
LV	course	Lehrveranstaltung
RÜ	computing lab	Rechnerübung
S	summer term	Sommersemester
Sem.	semester/term	Semester
ER/SPO	examination regulations	Studien- und Prüfungsordnung
KS/SQ	key skills	Schlüsselqualifikationen
SWS	contact hour	Semesterwochenstunde
Ü	excercise course	Übung
V	lecture	Vorlesung
W	winter term	Wintersemester

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.

IW3BWLFBV3 - Risk and Insurance Management (S. 48)

Anmerkungen

The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in winter term 2010/11.

IW3BWLFBV4 - Insurance Markets and Management (S. 49)

Anmerkungen

The course *Insurance Marketing* [26323] is offered in winter term 2010/11 and is held by Dr. Edmund Schwake. Furthermore the course is offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de
This module was formerly named *Insurance Management*.

IW3VWL1 - Applied Game Theory (S. 54)

Anmerkungen

The lecture *Competition in Networks* [26240] was included in this module in winter term 2010/11.

IW3VWL6 - Microeconomic Theory (S. 56)

Anmerkungen

The lecture *Competition in Networks* [26240] was included in this module.

IW3OR6 - Methodical Foundations of OR (S. 61)

Anmerkungen

The planned lectures and courses for the next three years are announced online (http://www.ior.kit.edu).
For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

IW3INAIFB2 - Semantic Knowledge Management (S. 64)

Anmerkungen

The lecture *Special Topics of Knowledge Management* was added to the module.

IW3INGIS - Foundations of Information Systems (S. 69)

Anmerkungen

The courses in this module are offered irregularly, however, the exam can be taken anytime.
The lecture *Die digitale Bibliothek* is no longer offered. Examination is still possible in the summer term 2010.

IW3INSWT2 - Software Engineering II (S. 79)

Anmerkungen

See German version.
This module will be offered as of the winter term 2010/11.

IW3INFOO - Advanced object orientation (S. 81)

Anmerkungen

The module is not lectured in the summer term 2010.

wms - Workflowmanagement-Systems (S. 277)

Anmerkungen

The module is no longer offered, examination is possible until summer term 2011.
Starting with the winter term 2010/11 the new module *Konzepte und Anwendungen von Workflowsystemen* [IN4INKAW] (5 credit points) is offered.

26326 - Enterprise Risk Management (S. 130)

Anmerkungen

To attend the course please register at the secretariy of the chair of insurance science.
In the winter term 2010/11 the course is held by Dr. Edmund Schwake.

AlgoMO - Algorithmic Methods for Hard Optimization Problems (S. 91)

Anmerkungen

This lecture is currently not offered.

FOO - Advanced object orientation (S. 136)

Anmerkungen

The course is not lectured in the summer term 2010.

26323 - Insurance Marketing (S. 148)

Anmerkungen

This course is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.

This course is offered on demand. For further information, see: http://insurance.fbv.uni-karlsruhe.de

To attend the course please register at the secretary of the chair of insurance science.

4   Modules of term 1-4

4.1   Informatics

Module: Foundations in Informatics [IW1INF1]

Coordination: Tanja Schultz
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
10	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24001	Basic Notions of Computer Science (p. 141)	2/1/2	W	5	T. Schultz
24004	Programming (p. 199)	2/0/2	W	5	A. Pretschner

Learning Control / Examinations
The assessment of this module consists of

1. Completion of *Basic Notions of Computer Science* [24001]

2. Completion of *Programming* [24004]

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 §8 (1) of the examination regulation 2009. 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.

Conditions
None.

Learning Outcomes
Students should learn

- methods of defining properties and how to read and understand definitions.

- the difference between syntax and semantics

- basic concepts of discrete mathematics and informatics and the ability to apply them to problem descriptions and proofs.

- basic structures of the programming language Java and how to apply them (in particular control and simple data structures, object orientation and implementation of basic algorithms) as well as basics of programming methodology

- the ability to autonomously write executable small to medium sized executable Java programs

Content
This module and the associated courses cover an introduction to foundations in informatics as well as basic programming skills with Java. Topics in „Grundbegriffe der Informatik" are for example algorithms, formal languages, definitions, relations, functions, graphs and syntax and semantics. The discussed concepts will be exemplified by the associated exercises. Programming covers the concepts and methodology of programming using the programming language Java.
Both courses come along with exercises which apply the theoretical knowledge and reinforce them.

Module: Algorithms I [IW2INF2]

Coordination: Peter Sanders, Dorothea Wagner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24500	Algorithms I (p. 87)	3/1/2	S	6	P. Sanders

Learning Control / Examinations
The assessment of this module consists of:

1. a written exam (120 min) according to sec. 4 subsec. 2 no. 1 study and examination regulations.

2. a certificate (not graded) for the exercise according to sec. 4 subsec. 2 no. 3 study and examination regulations.

The grade of the module corresponds to the grade of the written exam.

Conditions
None.

Learning Outcomes
The student is supposed to

- know and understand basic, frequently used algorithms, their conception, analysis of their correctness and efficiency, implementation, documentation and application

- be able to use their comprehension to work on new algorithmic problems

- apply the knowledge acquired in the module *Grundlagen der Informatik* (B.Sc. Information Engineering and Management) to non-trivial algorithms

- apply the knowledge acquired in the module *Grundbegriffe der Informatik* (Bachelor Informatics) or in *Grundlagen der Informatik* (B.Sc. Information Engineering and Management) and the mathematical methodologies learned in the mathematics lectures to solve problems, the focus being on both formal correctness arguments and mathematical efficiency analysis

Content
The module contains the „basic toolbox for algorithmics". The following topics are covered in particular:

- result analysis (checkers) and certification

- asymptotic algorithm analysis: worst case, average case, probabilistic, amortised

- basic terms of algorithm engineering

- efficient application of linked lists

- unlimited arrays, batches and queues

- hash tables: with linking, linear probing, universal hashing

- sorting: efficient algorithms (mergesort, quicksort), lower border, radix sort

- selection: quickselect

- sorted sequences/search trees: How to support all important operations within logarithmic time?

- graphs (representation, traversing: breadth search, deep search, applications (topological sorting,...), shortest path: Dijkstra's algorithm, Bellman-Ford algorithm, minimum spanning trees: Kruskals algorithm, Jarnik-Prim algorithm)

- generic optimisation algorithms (greedy, dynamic programming, systematic search, local search)

Module: Theoretical Informatics [IW2INF3]

Coordination: Dorothea Wagner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
7	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24005	Theoretical Foundations of Computer Science (p. 263)	3/1	W	7	D. Wagner

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

Conditions
None.

Learning Outcomes
The student

- has a deeper insight into the fundamentals of theoretical computer science and knows the computation models and proof techniques,

- understands the limits and possibilities of computer science in relation to the solution of definable but only partially predictable problems

- knows basic aspects of computer science in contrast to specific circumstances, such as specific computers or programming languages and also can phrase general statements about the solvability of problems

- is able to apply the proof techniques learned for the specification of systems of computer science and for the systematic design of programs and algorithms

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

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

Module: Computer Engineering [IW2INF4]

Coordination: Wolfgang Karl
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24502	Computer Organization (p. 207)	3/1/2	S	6	T. Asfour, R. Dillmann, J. Henkel, W. Karl

Learning Control / **Examinations**
The assessment consists of a written examination (60 minutes) according to sec. 4 subsec. 2, no. 1 study and examination regulations.

Conditions
None.

Learning Outcomes
The students are to be enabled to

- gain fundamental knowledge of computer organization, i.e. the architecture and the operation principle of computer systems,
- understand the relationship between hardware concepts and their effects on the software, in order to build efficient programs,
- comprehend the fundamental principles of the design process and being able to apply them, based on the understanding of the interdependencies of technology, computer concepts and applications,
- build up a computer from basic components.

Content
This course deals with the fundamentals of computer organisation; the instruction set architecture in conjunction with the discussion RISC – CISC; pipelining, pipeline constraints and methods for the resolution of pipeline conflicts; memory organization, cache memory; I/O system and interface modules; interrupt handling; bus systems; support of operating system functions: virtual memory management and protection mechanisms.

Module: Applied Informatics [IW1INF5]

Coordination: Andreas Oberweis, Stefan Tai
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25070	Applied Informatics I - Modelling (p. 98)	2/1	W	4	A. Oberweis, R. Studer, S. Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce (p. 99)	2/1	S	4	S. Tai

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.

Conditions
None.

Recommendations
Knowledge of the module *Foundations in Informatics* [IW1INF1] as well as *Algorithms I* [IW2INF2] is expected.

Learning Outcomes
The student should:

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

Content
The course *Applied Informatics I* [25070] mainly adresses 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 consecutive course *Applied Informatics II* [25033] covers various facets of electronic commerce which have to be supported by adequate and efficient distributed 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).

4.2   Business Administration

Module: Foundations in Business Administration [IW1BWL1]

Coordination: Christof Weinhardt, Marliese Uhrig-Homburg
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
8	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25002/25003	Financial Accounting and Cost Accounting (p. 209)	2/2	W	4	T. Burdelski
26490	Introduction to Information Engineering and Management (p. 125)	2/2	S	4	C. Weinhardt, A. Geyer-Schulz

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

Conditions
None.

Learning Outcomes
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.

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.

Module: Business Administration [IW1BWL2]

Coordination: Christof Weinhardt, Marliese Uhrig-Homburg
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
8	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25026/25027	Business Administration and Management Science C (p. 94)	2/0/2	W	4	H. Lindstädt, M. Ruckes, M. Uhrig-Homburg, T. Burdelski
25024/25025	Business Administration and Management Science B (p. 93)	2/0/2	S	4	W. Gaul, T. Lützkendorf, A. Geyer-Schulz, C. Weinhardt, T. Burdelski

Learning Control / Examinations

Conditions
None.

Recommendations
It is highly recommended to fulfil this module only after completing the module *Foundations in Business Administration* [IW1BWL1].

Learning Outcomes
The student should be able to

- formulate, asses and chose strategies , and is in control of the terminology, the goals and the requirements of organisational management

- know three kinds of information asymmetry in organisations and their implications on the desing of contracts

- know the notions, functions, areas and tools of controlling

- describe the impacts and features of marketing instruments

- knows the problem formulation and theories of production management, including the areas of energy, construction, real-estate and ergonomics.

- evaluate information as a competitive factor and is in control of the terminology and the methods to asses information

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

4.3 Economics

Module: Economics [IW1VWL]

Coordination: Siegfried Berninghaus, Clemens Puppe
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
5	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25012	Economics I: Microeconomics (p. 268)	3/0/2	W	5	S. Berninghaus

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 the end of the examination period of the third semester.

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.

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

4.4 Operations Research

Module: Introduction to Operations Research [IW1OR]

Coordination: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every 2nd term, Summer Term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25040	Introduction to Operations Research I (p. 122)	2/2/2	S	4.5	S. Nickel, O. Stein, K. Waldmann
25043	Introduction to Operations Research II (p. 123)	2/2/2	W	4.5	S. Nickel, O. Stein, K. Waldmann

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.

Conditions
None.

Recommendations
Mathematics I und II. Programming knowledge for computing exercises.
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.

4.5   Statistics

Module: Statistics [IW1STAT]

Coordination: Svetlozar Rachev, Markus Höchstötter
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
10	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25008/25009	Statistics I (p. 256)	4/0/2	S	5	M. Höchstötter
25020/25021	Statistics II (p. 257)	4/0/2	W	5	M. Höchstötter

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.

Conditions
None.

Recommendations
To some extend knowledge of the content of the module Mathematics is assumed. Therefore it is advisable to pass the course *Mathematik I für Informationswirtschaft* [01360] before attending the module *Statistics* [IW1STAT].
It ist 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 und bivariate analysis
B. Probability Theory: probability space, conditional and product probabilities, transformation of probabilities, parameters of location and dispersion, most importand discrete and continuous distributions, covariance and correlation, convolution and limit distributions
C. Theory of estimation and testing: suffiency of statistics, point estimation (optimality, ML-method), internal estimations, theory of tests (optimality, most important examples of tests)

4.6   Law

Module: Introduction to Civil Law [IW1JURA1]

Coordination: Thomas Dreier
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
4	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24012	Civil Law for Beginners (p. 107)	4/0	W	4	T. Dreier, P. Sester

Learning Control / Examinations
The assessment of this module consists of a written examination (90 min) according to § 4(2), 1 of the examination regulation. The grade of the module is the grade of the written examination.

Conditions
None.

Learning Outcomes
The student

Content
The module genrally introduces 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 basiscs 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.

Module: Commercial Law [IW1JURA2]

Coordination: Peter Sester
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24504	Advanced Civil Law (p. 108)	2/0	S	3	T. Dreier, P. Sester
24011	Commercial and Corporate Law (p. 143)	2/0	W	3	P. Sester
24506/24017	Exercises in Civil Law (p. 198)	2/0	W/S	3	P. Sester, T. Dreier

Learning Control / Examinations
The assessment of this module consists of a written examination according to § 4(2), 1 of the examination regulation.
The grade of the module is the grade for the written examination.

Conditions
None.

Learning Outcomes
The student

- possesses in-depth knowledge of the general and specific law of obligations and of property law;

- is able to penetrate the interaction of the statutory provisions of the German Civil Code (different types of contracts and the respective rules on liability; performance; impairment of performance; the different ways by which property may be transferred and the *in rem* security rights) and of commercial and company law (especially in respect of the peculiarities of commercial transactions, commercial agency, the law of merchants as well as German law of business organizations);

- in the Private Law Exercises ("Privatrechtliche Übung") gains the skill to solve legal problems using legal methods.

Content
The focus is on special types of contract as well as on complex legal set-ups in the area of company law.

Module: Constitutional and Administrative Law [IW1JURA3]

Coordination: Indra Spiecker genannt Döhmann
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24016	Public Law I - Basic Principles (p. 178)	2/0	W	3	I. Spiecker genannt Döhmann
24520	Public Law II - Public Economic Law (p. 179)	2/0	S	3	I. Spiecker genannt Döhmann

Learning Control / Examinations
The assessment of this module consists of a written examination (90 min) according to § 4(2), 1 of the examination regulation for the courses *Public Law I* and *II*.
The grade of the module is the grade for the written examination.

Conditions
The course *Public Law I* [24016] has to be attend before the course *Public Law II* [24520].

Learning Outcomes
The lecture covers the core principles of public law. Students shall become acquainted with the basics of constitutional law, the fundamental rights which route governmental actions and the entire legal system, as well as possibilities of actions and instruments (especially law, administrative act, public-private contract) of the public authority. Furthermore the distinction between public and private law will be clarified. Moreover, possibilities of legal protection regarding administrative behavior will be addressed. Students shall learn to classify problems in public law and to solve (simple) administrative and constitutional cases.

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 (simple) administrative and constitutional cases

4.7   Mathematics

Module: Mathematics I [IW1MATH1]

Coordination: Christian Wieners
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Mathematics

ECTS Credits	Cycle	Duration
8	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
01360	Mathematics I for Information Engineering and Management (p. 167)	4/2/2	W	8	A. Rieder, C. Wieners, N. Neuss

Learning Control / Examinations

The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics I (1 credit) and

2. a written examination of 60 minutes on the lectures mathematics I following §4(2), 1 of the examination regulations (7 credits).

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

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 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.

Remarks

None.

Module: Mathematics II [IW1MATH2]

Coordination: Christian Wieners
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Mathematics

	ECTS Credits	Cycle	Duration
	8	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
01877	Mathematics II for Information Engineering and Management (p. 168)	4/2/2	S	8	A. Rieder, C. Wieners, N. Neuss

Learning Control / Examinations

The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics II and

2. a written examination of 60 minutes on the lectures mathematics II following §4(2), 1 of the examination regulations.

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

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 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.

4.8 General Modules

Module: Internship [IW1EXPRAK]

Coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften)
Degree programme: Informationswirtschaft (B.Sc.)
Subject:

ECTS Credits 8	Cycle	Duration

Learning Control / Examinations
The assessment is in the form of a certificate of employment about at least 6 weeks, a written report (typewritten, not handwritten) and a short presentation.

Conditions
The internship is regulated in §12 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
This module serves to impart interdisciplinary key qualifications:

The student

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

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

Content
It is the responsibility of the students to apply for an internship in a suitable company or public organization at which the internship can be fulfilled.
The process for the internship has the following (sequential) steps:

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

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

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

4. **Presentation and proof of performance.**
   The short presentation may by given in the form of a talk with the examiner, in a colloquium or in a seminar. The form is fixed at the registration of the internship with the examiner. The certificate of employment of the company and the short report must be delivered at the examiner *before* the presentation. Based on these, a certificate of performance if produced and transferred to the office of study ("Studienbüro").

Remarks
The form for the internship is available at the examination offices of the two faculties participating in the programme.

5   Modules of term 5-6

5.1   General Modules

Module: Seminar Module Informatics [IW3SEMINFO]

Coordination: Martina Zitterbart
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
3	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079s	Seminar in Algorithm Design (p. 212)	2	W/S	3	D. Wagner
24074s	Seminar in Telematics (p. 215)	2	W/S	4	M. Zitterbart, H. Hartenstein
SemAIFB1	Seminar in Enterprise Information Systems (p. 218)	2	W/S	3	R. Studer, A. Oberweis, T. Wolf, R. Kneuper
xIDLs	Seminar Internet Services (p. 223)	2	W/S	3	H. Schmeck, S. Tai, W. Juling, R. Studer, H. Hartenstein, W. Tichy
SemAIFB4	Seminar Knowledge Management (p. 227)	2	W	3	R. Studer
SWSSem	Seminar Software Systems (p. 224)	2	W/S	3	R. Reussner
SWTSem	Seminar Software Engineering (p. 225)	2	W/S	3	W. Tichy, R. Reussner, G. Snelting
SemSich	Seminar in Security (p. 217)	2	W/S	3	J. Müller-Quade, M. Zitterbart
SemiKryp3	Seminar in Cryptography (p. 214)	2	W/S	3	J. Müller-Quade
SemInfo	Informatics Seminar (p. 146)	2	W/S	3	M. Zitterbart
prosemis	Undergraduate Seminar Information Systems (p. 202)	2	S	3	K. Böhm

Learning Control / Examinations
The assessment is done by a seminar with at least 3 CP.
The assessment of the seminar (following §4(2), 3 ER) is described at the course description.

Conditions
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.
see german version

Learning Outcomes
The student

- deals with a well-defined problem in the Informatics domain in detail,

- analyses and discusses the given problems as part of the courses and in the final seminar papers,

- discusses, presents, and defends technical arguments within the given task specifications,

- organises the drafting of the final seminar paper mostly independently.

The competences gained as part of this seminar module serve as a preparation for the Bachelor thesis. Guided by the respective examiner, the student exercises independent scientific work in drafting and presenting the final seminar paper.

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

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

Module: Seminar Module Economic Sciences [IW3SEMWIWI]

Coordination: Studiendekan (Fak. f. Wirtschaftswissenschaften)
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization), OR (Specialization), Business Administration (Specialization)

ECTS Credits	Cycle	Duration
3	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26524	Bachelor Seminar in Information Engineering and Management (p. 102)	2	W/S	3	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management (p. 222)	2	W/S	3	C. Weinhardt
SemIIP2	Seminar in Industrial Production (p. 221)	2	W/S	3	F. Schultmann, M. Fröhling, M. Hiete
SemEW	Seminar Energy Economics (p. 219)	2	W/S	3	W. Fichtner, D. Möst, P. Jochem
25191	Bachelor Seminar in Foundations of Marketing (p. 103)	2/0	W/S	3	W. Gaul
25915/25916	Seminar: Management and Organization (p. 237)	2	W/S	3	H. Lindstädt
25293	Seminar in Finance (p. 220)	2	W/S	3	M. Uhrig-Homburg, M. Ruckes
SemFBV1	Seminar in Insurance Management (p. 228)	2	W/S	3	U. Werner
SemFBV2	Seminar in Operational Risk Management (p. 229)	2	W/S	3	U. Werner
SemFBV3	Seminar in Risk Theory and Actuarial Science (p. 233)	2	W/S	3	C. Hipp
26420	Topics of Sustainable Management of Housing and Real Estate (p. 100)	2	W/S	3	T. Lützkendorf
SemWIOR3	Seminar in Experimental Economics (p. 231)	2	W/S	3	S. Berninghaus
SemWIOR4	Seminar in Game and Decision Theory (p. 234)	2	W/S	3	S. Berninghaus
SemWIOR2	Seminar Economic Theory (p. 274)	2	W/S	3	C. Puppe
25131	Seminar in Continous Optimization (p. 232)	2	W/S	3	O. Stein
SemWIOR1	Seminar Stochastic Models (p. 226)	2	W/S	3	K. Waldmann
25491	Seminar in Discrete Optimization (p. 230)	2	W/S	3	S. Nickel

Learning Control / Examinations
The assessment is done by a seminar with at least 3 CP.
The assessment of the seminar (following §4(2), 3 ER) is described at the course description.

Conditions
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.
See German version.

Learning Outcomes

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

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

Module: Seminar Module Law [IW3SEMJURA]

Coordination: Thomas Dreier
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Law (Specialization)

ECTS Credits	Cycle	Duration
3	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
rechtsem	Seminar in Law (p. 216)	2	W/S	3	T. Dreier, P. Sester, I. Spiecker genannt Döhmann
24781	(p. 235)	2	S	3	I. Spiecker genannt Döhmann
24357	(p. 236)	2	W	3	R. Reussner, M. Kuperberg, K. Melullis

Learning Control / Examinations
The assessment is done by a seminar with at least 3 CP.
The assessment of the seminar (following §4(2), 3 ER) is described at the course description.

Conditions
From the law modules in the core programme, *Introduction to Civil Law* [IW1INJURA1], *Commercial Law* [IW1INJURA2], and *Constitutional and Administrative Law* [IW1INJURA2], 2 out of 3 have to be completed successfully.

Learning Outcomes

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

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

Module: Bachelor Thesis [IW3THESIS]

Coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften), Der Vorsitzende des Prüfungsausschusses
Degree programme: Informationswirtschaft (B.Sc.)
Subject:

ECTS Credits	Cycle	Duration
12		

Learning Control / Examinations
The Bachelor thesis is examined by an examiner following the examination regulation. The examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.

Conditions
The regulations for the Bachelor thesis can be found in §11 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.

5.2 Law

Module: Intellectual Property and Data Protection [IW3JURA]

Coordination: Thomas Dreier
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Law (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24070	Industrial Property and Copyright Law (p. 138)	2/0	W	3	T. Dreier
24018	Data Protection Law (p. 118)	2/0	W	3	I. Spiecker genannt Döhmann

Learning Control / Examinations

Conditions
From the law modules in the core programme, *Introduction to Civil Law* [IW1INJURA1], *Commercial Law* [IW1INJURA2], and *Constitutional and Administrative Law* [IW1INJURA2], 2 out of 3 have to be completed successfully.

Learning Outcomes

Content
Building onto what the students have learned in law during the first two years of Bachelor studies, the module *Law* in the third Bachelor years has the purpose of both deepening and specialising the legal studies in areas of practical importance for information economics and management...

5.3 Business Administration

Module: eBusiness and Servicemanagement [IW3BWLISM1]

Coordination: Christof Weinhardt
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26466	eServices (p. 132)	2/1	S	5	C. Weinhardt, G. Satzger
26452	Management of Business Networks (p. 162)	2/1	W	4.5	C. Weinhardt, J. Kraemer
26454	eFinance: Information Engineering and Management for Securities Trading (p. 121)	2/1	W	4.5	C. Weinhardt, R. Riordan
26478	Special Topics in Information Engineering & Management (p. 246)	3	W/S	4.5	C. Weinhardt

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

Conditions
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.

Learning Outcomes
The students

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

Content
This module gives an overview of the mutual dependencies of strategic management and information systems. The central role of information is exemplified by the structuring concept of the *information life cycle*. The single phases of this life cycle from generation over allocation until dissemination and use of the information are analyzed from a business and microeconomic perspective, applying classical and new theories. The state of the art of economic theory on aspects of the information life cycle are presented. The lecture is complemented by exercise courses.
The courses "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 tradingprovides theoretically profound and also practical-oriented background about the functioning of international financial markets. The focus is placed on the economic and technical design of markets as information processing systems.
In "eServices" the increasing impact of electronic services compared to the traditional services is outlined. The Information- und Communication Technologies enable the provision of services, which are mainly characterized by interactivity and individuality. This course provides basic knowledge about the development and management of ICT-based servies.
The theortic fundamentals of Information Engineering and Management can be enriched by a practical experience in Special Topics in Information Engineering and Management. Any practical Seminar at the IM can be chosen for the course Special Topics in Information Engineering and Management.

Module: Supply Chain Management [IW3BWLISM2]

Coordination: Christof Weinhardt
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26452	Management of Business Networks (p. 162)	2/1	W	4.5	C. Weinhardt, J. Kraemer
26496	Management of Business Networks (Introduction) (p. 163)		W	3	C. Weinhardt, J. Kraemer
25486	Facility Location and Strategic Supply Chain Management (p. 254)	2/1	S	4.5	S. Nickel
2118078	Logistics - Organisation, Design, and Control of Logistic Systems (p. 158)	3/1	S	6	K. Furmans
2118090	Quantitative Methods for Supply Chain Risk Management (p. 203)	3/1	S	6	Cardeneo
25488	Tactical and Operational Supply Chain Management (p. 261)	2/1	W	4.5	S. Nickel

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

Conditions
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.

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. The course MBN introduction is consisting out of the first part of the regular MBN lecture, but as it has less credits will not include the analysis of the case study.
The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

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

Module: eFinance [IW3BWLISM3]

Coordination: Christof Weinhardt
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26454	eFinance: Information Engineering and Management for Securities Trading (p. 121)	2/1	W	4.5	C. Weinhardt, R. Riordan
25762	Intelligent Systems in Finance (p. 150)	2/1	S	5	D. Seese
26550	Derivatives (p. 119)	2/1	S	4.5	M. Uhrig-Homburg
25296	Exchanges (p. 109)	1	S	1.5	J. Franke
26570	International Finance (p. 153)	2	S	3	M. Uhrig-Homburg, Walter

Learning Control / Examinations

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

Conditions

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.

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. In addtion the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a suplementary understanding for capital markets.
Information management topics are in the focus of the lecture "eFinance: information engineering and management for securities trading". For the functioning of the international finance markets, it is necessary that there is an efficient information flow. Also, the regulatory frameworks play an important role. In this context, the role and the functioning of (electronic) stock markets, online brokers and other finance intermediaries and their platforms are presented. Not only IT concepts of German finance intermediaries are presented, but also international system approaches will be compared. The lecture is supplemented by speakers from the practice (and excursions, if possible) coming from the Deutsche Börse and the Stuttgart Stock Exchange.

Remarks

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

Module: CRM and Service Management [IW3BWLISM4]

Coordination: Andreas Geyer-Schulz
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26508	Customer Relationship Management (p. 112)	2/1	W	4.5	A. Geyer-Schulz
26522	Analytical CRM (p. 96)	2/1	S	4.5	A. Geyer-Schulz
26520	Operative CRM (p. 181)	2/1	W	4.5	A. Geyer-Schulz

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Therby every leture is examined by a written exam (according to Section 4(2), 1 of the examination regulation) and by succcessful completion of exercises (according to Section 4 (2), 3 of the examination regulation).

The grades of the individual lectures consists of the grade of the written exam (approximately 90 percent resp. 100 of 112 points) and of the exercise performance (approximately 10 percent resp. 12 of 112 points). In the case of passing the written exam (50 points) the points of the exercise performance will be added to the points of the written exam. The assessment procedures are described for each course of the module seperately.

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

Conditions

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.

Learning Outcomes

The student

- understands service management as the managerial foundation of customer relationship management and the resulting implications for strategic management, the organisational structure, and the functional areas of the comapany,

- develops and designs service concepts and service systems on a conceptual level,

- works in teams on case studies and respects project dates, integrates international literature of the discipline,

- knows the current developments in CRM in science as well as in industry,

- knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases,

- designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, . . .).

Content

In the module *CRM and Service Management* [IW3BWLISM4] 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 implmentation of service management in all parts of the company. For operative CRM we present the design of customer-oriented, IT-supported business processes based on business process modelling and we explain these processes in concrete application scenarios (e.g. marketing campaign management, call center management, sales force management, field services, . . .).

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

Remarks

The lecture *Customer Relationship Management* [26508] is given in English.

Module: Specialization in Customer Relationship Management [IW3BWLISM5]

Coordination: Andreas Geyer-Schulz
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26522	Analytical CRM (p. 96)	2/1	S	4.5	A. Geyer-Schulz
26520	Operative CRM (p. 181)	2/1	W	4.5	A. Geyer-Schulz
25158	Corporate Planning and Operations Research (p. 265)	2/1	W	4.5	W. Gaul
26240	Competition in Networks (p. 273)	2/1	W	4.5	K. Mitusch
26466	eServices (p. 132)	2/1	S	5	C. Weinhardt, G. Satzger

Learning Control / Examinations

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

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

Conditions

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

- It is only possible to choose this module in combination with the module *CRM and Servicemanagement* [IW3BWLISM4]. The module is passed only after the final partial exam of *CRM and Servicemanagement* is additionally passed.

- Or the course *Analytic CRM* [26522] or the course *Operative CRM* [26520] has to be taken.

Learning Outcomes

The student

- knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases,

- gains an overview of the market for CRM software,

- designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, . . .),

- is aware of the problems of protecting the privacy of customers and the implications of privacy law.

Content

In this module, analsis methods and techniques for the management and improvement of customer relations are presented. Furthermore, modelling, implementation, introduction, change, analysis and valuation of operative CRM processes are treated. Regaring the first part, we teach analysis methods and techniques suitable for the management and improvement of customer relations. For this goal we treat the principles of customer- and service-oriented management as the foundation of successful customer relationship management. In addition, we show how knowledge of the customer can be used for decision-making at an aggregate level (e.g. planning of sortiments, analysis of customer loyality, . . .). A basic requirement for this is the integration and collection of data from operative processes in a suitably defined data-warehouse in which all relevant data is kept for future analysis. The process of transfering data from the operative systems into the data warehouse is known as the ETL process (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 statistic methods (e.g. cluster analysis, regression analysis, stochastic models, . . .) are presented which help in computing suitable key performance indicators or which support decision-making.

Regaring the opervative part, we emphasize the design of operative CRM processes. This includes the modelling, implementation, introduction and change, as well as the analysis and evaluation of operative CRM processes. Petri nets and their extensions

are the scientific foundation of process modelling. The link of Petri nets to process models used in industry as e.g. UML activity diagrams is presented. In addition, a framework for process innovation which aims at a radical improvement of key business processes is introduced. The following application areas of operative CRM processes are presented and discussed:

- Strategic marketing processes
- Operative marketing processes (campaign managament, permission marketing, . . .)
- Customer service processes (sales force management, field services, call center management, . . .)

Module: Foundations of Marketing [IW3BWLMAR]

Coordination: Wolfgang Gaul, Bruno Neibecker
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25150	Marketing and Consumer Behavior (p. 165)	2/1	W	4.5	W. Gaul
25154	Modern Market Research (p. 171)	2/1	S	4.5	W. Gaul
25156	Marketing and Operations Research (p. 166)	2/1	S	4.5	W. Gaul
25177	Brand Management (p. 164)	2/1	W	4.5	B. Neibecker

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 9 CP as it is possible to examine in these additional lecutres and influence the final grade positively.

Conditions

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.

Learning Outcomes

Content

Module: Strategy and Organization [IW3BWLUO1]

Coordination: Hagen Lindstädt
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25900	Management and Strategy (p. 264)	2/0	S	4	H. Lindstädt
25902	Managing Organizations (p. 184)	2/0	W	4	H. Lindstädt
25907	Special Topics in Management: Management and IT (p. 250)	1/0	W/S	2	H. Lindstädt

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
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.

Learning Outcomes

Content

Module: Industrial Production I [IW3BWLIIP1]

Coordination: Frank Schultmann
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25950	Fundamentals of Production Management (p. 142)	2/2	S	5.5	F. Schultmann
25960	Material Flows in Industrial Production (p. 259)	2/0	W	3.5	M. Hiete
25996	Logistics and Supply Chain Management (p. 160)	2/0	W	3.5	F. Schultmann

Learning Control / Examinations

The module contains "Fundamentals of Production Management" [25950] and one optional course. The examination will be in form of individual written exams acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

The overall modular grade is calculated by weighing the individual grades with the according credit points. The grade will be truncated after the first decimal. Additional results may be considered on request.Assessment procedures are described separately for each course of the module.

Conditions

Specific precondition "Information Engineering and Management" (B.Sc.): Successful passing of all modules in semesters 1-4 (keys [IW1. . .]) with at maximum two modules left to complete, not considering the internship [IW1EXPRAK] and "Business and Public Law" [IW1INJURA] modules.

The course "Fundamentals of Production Management" [25950] and one additional activity have to be chosen.

Recommendations

All courses are specifically designed to be taken independently.

Bearing in mind the master programme, we recommend combining this module with "Industrial Production II" [WW4BWLIIP2] and/or "Industrial Production III" [WW4BWLIIP6].

Learning Outcomes

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

Content

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

Module: Energy Economics [IW3BWLIIP2]

Coordination: Wolf Fichtner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26010	Introduction to Energy Economics (p. 124)	2/2	S	5.5	W. Fichtner
26012	Renewable Energy Sources - Technologies and Potentials (p. 131)	2/0	W	3.5	W. Fichtner
25959	Energy Policy (p. 128)	2/0	S	3.5	M. Wietschel

Learning Control / Examinations

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction in to Energy Economics* [26010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

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

Conditions

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.

Learning Outcomes

Content
Introduction to Energy Economics
Renewable Energies
Energy Policy

Remarks
Additional courses (e.g. from other universities) might be accredited upon request at the institute.

Module: Essentials of Finance [IW3BWLFBV1]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26575	Investments (p. 155)	2/1	S	4.5	M. Uhrig-Homburg
25216	Financial Management (p. 134)	2/1	S	4.5	M. Ruckes

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
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.

Learning Outcomes
The student

- has fundamental skills in modern finance

- has fundamental skills to support investment decisions on stock, bond and derivative markets

- applies concrete models to assess investment decisions on financial markets as well as corporate investment and financing decisions.

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

Module: Insurance: Calculation and Control [IW3BWLFBV2]

Coordination: Christian Hipp
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26300	Insurance Models (p. 149)	2/2	S	5	C. Hipp, N.N.
26372	Insurance Game (p. 147)	2	S	4	C. Hipp, N.N.

Learning Control / Examinations
The assessment is carried out as a general written exam (according to Section 4(2), 1 of the examination regulation). In the lecture *Insurance Game* [26372] there has to be hold an oral presentation by each student as well (according to Section 4(2), 3 of the examination regulation). The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module consists of the grade of the written exam [80 percent) and the grade of the oral presentation (20 percent).

Conditions
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.

Learning Outcomes

Content

Module: Risk and Insurance Management [IW3BWLFBV3]

Coordination: Ute Werner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25055	Principles of Insurance Management (p. 196)	3/0	S	4.5	U. Werner
26326	Enterprise Risk Management (p. 130)	3/0	W	4.5	U. Werner

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The lectures are examined by oral presentations and related term papers in the context of the lectures. Furthermore, there is a final oral examination.

The grade of each examination consists of the oral presentation and the term paper (50 percent) and the oral examination (50 percent). The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
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.

Learning Outcomes
See German version.

Content
See German version.

Remarks
The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in winter term 2010/11.

Module: Insurance Markets and Management [IW3BWLFBV4]

Coordination: Ute Werner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25055	Principles of Insurance Management (p. 196)	3/0	S	4.5	U. Werner
26323	Insurance Marketing (p. 148)	3/0	W/S	4.5	U. Werner
25050	Private and Social Insurance (p. 197)	2/0	W	2.5	W. Heilmann, Besserer
26350	Current Issues in the Insurance Industry (p. 111)	2/0	S	2.5	W. Heilmann
26353	International Risk Transfer (p. 152)	2/0	S	2.5	W. Schwehr

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

Conditions
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.

Learning Outcomes
See German version.

Content
See German version.

Remarks
The course *Insurance Marketing* [26323] is offered in winter term 2010/11 and is held by Dr. Edmund Schwake. Furthermore the course is offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de
This module was formerly named *Insurance Management*.

Module: Topics in Finance I [IW3BWLFBV5]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25210	Management Accounting (p. 154)	2/1	S	4.5	T. Lüdecke
25232	Financial Intermediation (p. 135)	3	W	4.5	M. Ruckes
26550	Derivatives (p. 119)	2/1	S	4.5	M. Uhrig-Homburg
25296	Exchanges (p. 109)	1	S	1.5	J. Franke
25299	Business Strategies of Banks (p. 137)	2	W	3	W. Müller
26570	International Finance (p. 153)	2	S	3	M. Uhrig-Homburg, Walter
26454	eFinance: Information Engineering and Management for Securities Trading (p. 121)	2/1	W	4.5	C. Weinhardt, R. Riordan
26129	Specific Aspects in Taxation (p. 251)	3	W	4,5	B. Wigger, A. Presse

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

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.
It is only possible to choose this module in combination with the module *Essentials in Finance* [IW3BWLFBV1]. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

Learning Outcomes

The student

- has advanced skills in modern finance

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

Content

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

Module: Sustainable Construction [IW3BWLOOW1]

Coordination: Thomas Lützkendorf
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every 2nd term, Winter Term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26404w	Design, Construction and Assessment of Green Buildings I (p. 105)	2/1	W	4,5	T. Lützkendorf
26404	Sustainability Assessment of Construction Works (p. 106)	2/1	S	4,5	T. Lützkendorf

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 o. 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The final grade of the module is the average of the grades of each course weighted by the credits and truncated after the first decimal.
It is possible to include the grade of a seminar paper, dealing with a topic from the area of sustainable construction, into the final grade of the module (according to Section 4(2), 3 of the examination regulation). The seminar has a weight of 20 percent.

Conditions

Successful completion o the module *Business Administration* [WW1BWL].

Recommendations

The combination with the module *Real Estate Management* [IW3BWLOOW2] is recommended.
Furthermore a combination with courses in the area of

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

is recommended.

Learning Outcomes

The student

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

Content

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

Module: Real Estate Management [IW3BWLOOW2]

Coordination: Thomas Lützkendorf
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every 2nd term, Winter Term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26400w	Real Estate Management I (p. 205)	2/2	W	4,5	T. Lützkendorf
26400	Real Estate Management II (p. 206)	2/2	S	4,5	T. Lützkendorf

Learning Control / Examinations

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

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

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (REM I and REM II) happen in the same semester in which the lectures take place. Therefore, REM I exams currently only take place in the winter semester and REM II exams take place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

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

Conditions

Successful completion of the module *Business Administration* [WW1BWL].

Recommendations

The combination with the module *Design Constructions and Assessment of Green Buildings* [IW3BWLOOW1] is recommended. Furthermore a combination with courses in the area of

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

is recommended.

Learning Outcomes

The student

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

Content

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

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

Module: Human Resource Management [IW3BWLIAP1]

Coordination: Christine Harbring
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Business Administration (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25969	Compensation and Motivation (p. 266)	2/1	S	4,5	C. Harbring
n.n.	Human Resource Management and Labor Market Institutions (p. 186)	2/1	S	4,5	C. Harbring
25930	Strategic Human Resource Management (p. 260)	2/1	W	4,5	C. Harbring
25967	Industrial Studies of Time and Motion (p. 144)	2	W	3	S. Dürrschnabel
25934	Selected Topics in Ergonomics (p. 101)	2	W/S	3	D. Karl

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

Conditions
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.

Learning Outcomes

Content

5.4   Economics

Module: Applied Game Theory [IW3VWL1]

Coordination: Siegfried Berninghaus
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25525	Game Theory I (p. 252)	2/2	S	4.5	S. Berninghaus
25369	Game Theory II (p. 253)	2/2	W	4.5	S. Berninghaus
25371	Industrial Organization (p. 145)	2/2	S	4.5	S. Berninghaus
25373	Experimental Economics (p. 133)	2/2	S	4,5	S. Berninghaus, Kroll
26240	Competition in Networks (p. 273)	2/1	W	4.5	K. Mitusch

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Every singled lecture is examined within a 80 min. written exam at the end of the of the recess period. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
In the lecture *Experimental Economics* [25373] there may be the possibility - depending on the lecturer - to improve the final mark of the passed exam by writing a term paper and presenting it in class.

Conditions
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.
One of the lectures *Game Theory I* [25525] or *Game Theory II* [25369] has to be completed.

Recommendations
Good knowledge of mathematics and statistics is recommended.

Learning Outcomes
The student
- analyzes economic interdependencies under use of experimental mehtods and evaluates theoretial concepts,
- applies theoretical algorithms to economic and managerial problems,
- is able to analyze complex strategic decision problems by means of game theoretical concepts,
- knows basic solutions concepts of simple strategic decisions and is able to apply them to concrete economic problems,
- understands economic and managerial decision problems and is able to solve them by applying suitable solution concepts,
- knows experimental methods in economics from experiment design to evaluation of data.

Content
Lectures discuss individual as well as group decisions under (un-)certainty. Tutorials apply theoretical concepts to case studies. Theoretical models are compared to empirical findings.

Remarks
The lecture *Competition in Networks* [26240] was included in this module in winter term 2010/11.

Module: Strategic Games [IW3VWL4]

Coordination: Siegfried Berninghaus
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25525	Game Theory I (p. 252)	2/2	S	4.5	S. Berninghaus
25369	Game Theory II (p. 253)	2/2	W	4.5	S. Berninghaus
25365	Economics of Uncertainty (p. 180)	2/2	S	4.5	K. Ehrhart

Learning Control / Examinations
The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Every singled lecture is examined within a 80 min. written exam at the end of the of the recess period. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions
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.

Recommendations
It is recommended to attend the courses in the following sequence:

1. *Game Theory I* [25525]
2. *Game Theory II* [25369]

Learning Outcomes
The student
- structurizes complex strategic decision problems and applies efficient solution algorithms,
- has a broad overview over game and decision theory,
- applies tought methods to problems of political and managerial consulting,
- knows basic solution concepts of simple strategic decision situations and is able to apply them to concrete economic problems,
- knows and analyzes strategic decisions, knows advanced solution concepts and applies them,
- knows basic elements of decision theory under (un-)certainty as well as more advanced models and is able to analyze and solve these problems, understands decision behavior by cofronting it with experimental economics.

Content
The module consists of lectures in strategic decision making against other players or "nature". Building on normal and extensive form games different strategic and non-strategic decision situations are laid out. Then more complex situations (e.g., repeated bargaining, reputation building) are discussed.

Module: Microeconomic Theory [IW3VWL6]

Coordination: Clemens Puppe
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization)

ECTS Credits	Cycle	Duration
9	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25527	Advanced Topics in Economic Theory (p. 84)	2/1	S	4.5	C. Puppe, M. Hillebrand, K. Mitusch
25517	Welfare Economics (p. 276)	2/1	S	4.5	C. Puppe
25525	Game Theory I (p. 252)	2/2	S	4.5	S. Berninghaus
26240	Competition in Networks (p. 273)	2/1	W	4.5	K. Mitusch

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module seperately.
The overall grade of the the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
To improve the overall grade of the module, there might be taken optional term paper in the field of economics (ie, on the chairs Puppel, or at Berninghaus resp. at the IWW) within the module (according to Section 4(2), 3 of the examination regulation). The submission of the term paper is only admitted until the end of the following semester in which the last exam of the Economics-Module was absolved. It does not apply for term papers which are already taken in the Seminar Module. For more information, please visit the homepage of the Chair (http://vwl1.ets.kit.edu/).

Conditions
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.

Learning Outcomes

Content

Remarks
The lecture *Competition in Networks* [26240] was included in this module.

Module: Macroeconomic Theory [IW3VWL8]

Coordination: Clemens Puppe
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25543	Theory of Economic Growth (p. 270)	2/1	S	4,5	M. Hillebrand
25549	Theory of Business Cycles (p. 156)	2/1	W	4.5	M. Hillebrand

Learning Control / Examinations

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

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

To improve the overall grade of the module, there might be taken optional term paper in the field of economics (ie, on the chairs Puppel, or at Berninghaus resp. at the IWW) within the module (according to Section 4(2), 3 of the examination regulation). The submission of the term paper is only admitted until the end of the following semester in which the last exam of the Economics-Module was absolved. It does not apply for term papers which are already taken in the Seminar Module. For more information, please visit the homepage of the Chair (http://vwl1.ets.kit.edu/).

Conditions

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.

Recommendations

Grundlegende mikro- und makroökonomische Kenntnisse, wie sie beispielsweise in den Veranstaltungen *Volkswirtschaftslehre I (Mikroökonomie)* [25012] und *Volkswirtschaftslehre II (Makroökonomie)* [25014] vermittelt werden, werden vorausgesetzt. Aufgrund der inhaltlichen Ausrichtung der Veranstaltung wird ein Interesse an quantitativ-mathematischer Modellierung vorausgesetzt.

Learning Outcomes

Content

5.5 Statistics

Module: Statistical Applications of Financial Risk Management [IW3VWL]

Coordination: Svetlozar Rachev
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Economics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25325	Statistics and Econometrics in Business and Economics (p. 255)	2/2	W	4.5	W. Heller
25016	Economics III: Introduction in Econometrics (p. 269)	2/2	S	5	M. Höchstötter
25355	Bank Management and Financial Markets, Applied Econometrics (p. 104)	2/2	S	5	K. Vollmer
25375	Data Mining (p. 113)	2	W	5	G. Nakhaeizadeh

Learning Control / Examinations

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

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

Conditions

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.

Learning Outcomes

Content

5.6   Operations Research

Module: Applications of Operations Research [IW3OR5]

Coordination: Stefan Nickel
Degree programme: Informationswirtschaft (B.Sc.)
Subject: OR (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25486	Facility Location and Strategic Supply Chain Management (p. 254)	2/1	S	4.5	S. Nickel
25488	Tactical and Operational Supply Chain Management (p. 261)	2/1	W	4.5	S. Nickel
25490	Software Laboratory: OR Models I (p. 242)	1/2	W	4.5	S. Nickel
25134	Global Optimization I (p. 139)	2/1	W	4.5	O. Stein
25662	Simulation I (p. 240)	2/1/2	W	4.5	K. Waldmann

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

Conditions
Successful completion of the modules from terms 1-4 except for at most two modules. The module *internship* [IW1EXPRAK] as well as modules of *Law* [IW1JURA1,2,3] are not considered.
At least one of the courses *Facility Location and strategic Supply Chain Management* [25486] and *Tactical and operational Supply Chain Management* [25488] has to be taken.

Learning Outcomes
The student

- is familiar with basic concepts and terms of Supply Chain Management,

- knows the different areas of Supply Chain Management and their respective optimization problems,

- is acquainted with classical location problem models (in the plane, on networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,

- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

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

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

Remarks

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

Module: Methodical Foundations of OR [IW3OR6]

Coordination: Oliver Stein
Degree programme: Informationswirtschaft (B.Sc.)
Subject: OR (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25111	Nonlinear Optimization I (p. 176)	2/1	S	4.5	O. Stein
25113	Nonlinear Optimization II (p. 177)	2/1	S	4.5	O. Stein
25134	Global Optimization I (p. 139)	2/1	W	4.5	O. Stein
25136	Global Optimization II (p. 140)	2/1	W	4.5	O. Stein
25486	Facility Location and Strategic Supply Chain Management (p. 254)	2/1	S	4.5	S. Nickel
25679	Markov Decision Models I (p. 258)	2/1/2	W	5	K. Waldmann

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

Conditions
At least one of the lectures *Nonlinear Optimization I* [25111] and *Global Optimization I* [25134] has to be examined.
The lecture *Stochastische Entscheidungsmodelle I* [25679] cannot be examined.

Learning Outcomes
The student

- names and describes basic notions for optimization methods, in particular from nonlinear and from global optimization,

- knows the indispensable methods and models for quantitative analysis,

- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,

- validates, illustrates and interprets the obtained solutions.

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

Remarks
The planned lectures and courses for the next three years are announced online (http://www.ior.kit.edu).
For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

Module: Stochastic Methods and Simulation [IW3OR7]

Coordination: Karl-Heinz Waldmann
Degree programme: Informationswirtschaft (B.Sc.)
Subject: OR (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25679	Markov Decision Models I (p. 258)	2/1/2	W	5	K. Waldmann
25662	Simulation I (p. 240)	2/1/2	W	4.5	K. Waldmann
25665	Simulation II (p. 241)	2/1/2	S	4.5	K. Waldmann
25111	Nonlinear Optimization I (p. 176)	2/1	S	4.5	O. Stein
25488	Tactical and Operational Supply Chain Management (p. 261)	2/1	W	4.5	S. Nickel

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

Conditions
None.

Learning Outcomes
The student knows and understands stochastic relationships and has a competent knowledge in modelling, analyzing and optimizing stochastic systems in economics and engineering.

Content
Topics overview:
Stochastic Decision Models I: Markov Chains, Poisson Processes.
Simulation I: Generation of random numbers, Monte Carlo integration, Discrete event simulation, Discrete and continuous random variables, Statistical analysis of simulated data.
Simulation II: Variance reduction techniques, Simulation of stochastic processes, Case studies.

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

5.7   Informatics

Module: Web Information Systems [IW3INAIFB1]

Coordination: Stefan Tai
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
10	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25770	Service Oriented Computing 1 (p. 238)	2/1	W	5	S. Tai
25776	Cloud Computing (p. 110)	2/1	W	5	S. Tai, Kunze

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 and rounded to the first decimal.

Conditions
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.

Learning Outcomes
The student ackquires up-to-date knowledge about the design, development, and evaluation of modern, service-oriented Web information systems.

Content
Fundamentals (basic concepts, methods, technologies, and techniques) of service-oriented computing and cloud computing.

Module: Semantic Knowledge Management [IW3INAIFB2]

Coordination: Rudi Studer
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
10	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25740	Knowledge Management (p. 275)	2/1	W	5	R. Studer
25860sem	Special Topics of Knowledge Management (p. 249)	2/1	W/S	5	R. Studer
25736	Business Process Modelling (p. 170)	2/1	W	5	A. Oberweis, M. Mevius
25748	Semantic Web Technologies I (p. 211)	2/1	W	5	R. Studer, S. Rudolph, A. Harth

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 and truncated after the first decimal.

Conditions
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.

Learning Outcomes
Students

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

Content
In modern companies the availability and usability of knowledge is an essential factor of success for central managerial tasks and duties such as the improvement of business processes, product innovation and the amelioration of customer satisfaction. This module illustrates the typical problems of knowledge management in organizations and presents IT methods to approach these questions. The relevant groups of knowledge management systems are analyzed and expanded in the subject areas knowledge representation/semantic modeling and document management/groupware systems.

Remarks
The lecture *Special Topics of Knowledge Management* was added to the module.

Module: Semantic Web and Applications [IW3INAIFB3]

Coordination: Rudi Studer
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25748	Semantic Web Technologies I (p. 211)	2/1	W	5	R. Studer, S. Rudolph, A. Harth
25070s	Seminar in Applied Informatics (p. 213)	2	W/S	3	A. Oberweis, H. Schmeck, D. Seese, R. Studer, S. Tai

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 and truncated after the first decimal.

Conditions
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.

Learning Outcomes

Content

Module: Information Services in Networks [IW3INAIFB4]

Coordination: Hartmut Schmeck
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications (p. 92)	2/1	W	5	H. Schmeck
24074	Networked IT-Infrastructures (p. 267)	2/1	W	5	W. Juling
24124	Web Engineering (p. 271)	2/0	W	4	M. Nußbaumer
25776	Cloud Computing (p. 110)	2/1	W	5	S. Tai, Kunze
25748	Semantic Web Technologies I (p. 211)	2/1	W	5	R. Studer, S. Rudolph, A. Harth
xIDLp	Practical Course Internet Services (p. 190)	4	W/S	4	H. Schmeck, S. Tai, W. Juling, W. Tichy, R. Studer, H. Hartenstein

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 and truncated after the first decimal.

Conditions
None.

Learning Outcomes

Content

Module: Algorithms and Applications [IW3INAIFB5]

Coordination: Hartmut Schmeck
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25700	Efficient Algorithms (p. 120)	2/1	S	5	H. Schmeck
25702	Algorithms for Internet Applications (p. 92)	2/1	W	5	H. Schmeck
25706	Nature-inspired Optimisation (p. 173)	2/1	W	5	S. Mostaghim, P. Shukla
25704	Organic Computing (p. 183)	2/1	S	5	H. Schmeck, S. Mostaghim
25700sp	Special Topics of Efficient Algorithms (p. 248)	2/1	W/S	5	H. Schmeck

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 and truncated after the first decimal.

Conditions
None.

Learning Outcomes

Content

Module: Business Processes and Information Systems [IW3INAIFB8]

Coordination: Andreas Oberweis
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25726	Workflow-Management (p. 278)	2/1	S	5	A. Oberweis
25736	Business Process Modelling (p. 170)	2/1	W	5	A. Oberweis, M. Mevius
25786	Enterprise Architecture Management (p. 129)	2/1	W	5	T. Wolf
25770	Service Oriented Computing 1 (p. 238)	2/1	W	5	S. Tai
25790	Capability maturity models for software and systems engineering (p. 210)	2	S	4	R. Kneuper
PraBI	Computing Lab Information Systems (p. 189)	2	W/S	5	A. Oberweis, D. Seese, R. Studer
SBI	Special Topics of Enterprise Information Systems (p. 247)	2/1	W/S	5	A. Oberweis
25730	Software Technology: Quality Management (p. 245)	2/1	S	5	A. Oberweis

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 and truncated after the first decimal.

Conditions
At least one of the courses Workflowmangement [25726], *Modellierung von Geschäftsprozessen* [25736] or *Enterprise Architecture Management* [25786] has to be attended.

Learning Outcomes
Students

- are able to discuss about basic terms and principles of process modeling languages and methods, software quality and its management,
- can choose the appropriate modeling language and model and analyze business processes,
- analyze and evaluate quality aspects of process models,
- know methods and models for software quality certification and can apply software testing and measurement methods.

Content
Modeling the relevant aspects of a business process is the basis for efficient and effective support of this process in an enterprise information system.Detailed knowledge of languages, methods and software tools for supporting business process modeling is taught in this module.
Additionally fundamentals of software quality management are considered in this module. Maturity models like CMMI or SPICE for evaluation and improvement of a software development process are introduced.

Module: Foundations of Information Systems [IW3INGIS]

Coordination: Klemens Böhm
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
10	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24114	Data Warehousing and Mining (p. 114)	2/1	W	5	K. Böhm
24647	Deployment of Database Systems (p. 115)	2/1	S	5	K. Böhm
wms	Workflowmanagement-Systems (p. 277)	2	W	3	J. Mülle
24605	Data Privacy Protection in Interconnected Information Systems (p. 117)	2	S	3	K. Böhm, Buchmann
PLV	Selling IT-Solutions Professionally (p. 195)	2	S	1	K. Böhm, Hellriegel
PUB	Consulting in Practice (p. 194)	2	W/S	1	K. Böhm, Dürr
PMP	Project Management in Practice (p. 201)	2	S	1	K. Böhm, W. Schnober
24522	(p. 272)	0/1	S	1	
24111	Mechanisms and Applications of Workflow Systems (p. 157)	3	W	5	J. Mülle, Silvia von Stackelberg

Learning Control / Examinations

Conditions
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.

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

Learning Outcomes
The students

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

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

Remarks
The courses in this module are offered irregularly, however, the exam can be taken anytime.
The lecture *Die digitale Bibliothek* is no longer offered. Examination is still possible in the summer term 2010.

Module: Communication and Database Systems [IW3INKD]

Coordination: Klemens Böhm, Martina Zitterbart
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
8	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24516	Database Systems (p. 116)	2/1	S	4	K. Böhm
24519	Introduction in Computer Networks (p. 127)	2/1	S	4	H. Hartenstein

Learning Control / Examinations

The assessment consists of a 90 minutes written exam according to section 4 subsection 2 no. 1 study and examination regulations.
The grade of the module corresponds to the grade of the written exam.

Conditions

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.

Recommendations

Knowledge of the lecture *Software Engineering I* is recommended.

Learning Outcomes

The students will

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

Content

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

Module: Telematics [IW3INTM]

Coordination: Martina Zitterbart
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
10	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24519	Introduction in Computer Networks (p. 127)	2/1	S	4	H. Hartenstein
24128	Telematics (p. 262)	2	W	4	M. Zitterbart
24443	Applied Telematics (p. 193)	1	W	2	M. Zitterbart

Learning Control / Examinations

Conditions
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.

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

Learning Outcomes
The students will broaden their knowledge of computer networks initially learnt in the module Telematics [IW3INTM].
They learn about problems and solutions in the domains of wireless, multimedia, or secure communications and they will be able to analyse and evaluate specific solutions in those domains.

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

Module: Telematics II [IW3INTM2]

Coordination: Martina Zitterbart
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
8	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24643	Mobile Communications (p. 169)	2/0	S	4	O. Waldhorst
24132	Multimedia Communications (p. 172)	2/0	W	4	R. Bless
24601	Network Security: Architectures and Protocols (p. 174)	2/0	S	4	M. Schöller
24149	Network and IT-Security Management (p. 175)	2/1	W	5	H. Hartenstein

Learning Control / Examinations

Conditions
The module *Telematics* [IW3INTM] has to be taken.

Recommendations
The material covered in the courses of the module *Telematics* [IW3INTM] constitutes the basis for the lectures of this module and therefore should be known in advance.

Learning Outcomes
The students will broaden their knowledge of computer networks initially learnt in the module Telematics [IW3INTM].
They learn about problems and solutions in the domains of wireless, multimedia, or secure communications and they will be able to analyse and evaluate specific solutions in those domains.

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

Module: Algorithm Design [IW3INALGT]

Coordination: Dorothea Wagner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24614	Algorithms for Planar Graphs (p. 86)	2/1	S	3	D. Wagner
24171	Randomized Algorithms (p. 204)	2	W	3	T. Worsch
24123	Algorithm Engineering (p. 85)	2	W/S	3	P. Sanders, D. Wagner
24109	Parallel Algorithms (p. 185)	2	W/S	3	P. Sanders
AlgoMO	Algorithmic Methods for Hard Optimization Problems (p. 91)	2	W/S	3	D. Wagner, P. Sanders
24118	Algorithms for Visualization of Graphs (p. 90)	2	W/S	3	D. Wagner, R. Görke

Learning Control / Examinations

The assessment consists of an oral overall exam (approx. 45 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The grade of the module corresponds to the grade of the oral exam.

Conditions

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.

Learning Outcomes

The student

- identifies algorithmic problems from different areas and can formulate these formally,

- judges the computational complexity of algorithmic problems and recognizes suitable algorithmic techniques for solving these problems,

- knows the crucial methodical approaches for the design and analysis of algorithms,

- designs algorithms for specific applications,

- comments on methodical aspects of algorithmics in a qualified and well-structured manner.

Content

This module conveys profound knowledge concerning theoretical and practical aspects of algorithmics. Its theoretical focus is on algorithms for graphs and common algorithmical methods, particularly, on algorithmic methods concerning randomized algorithms, parallel algorithms and algorithms for NP-hard problems. Practical aspects involve methods from the field of algorithm engineering.

Module: [IW3INALGOP]

Coordination: Dorothea Wagner, Peter Sanders
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

	ECTS Credits	Cycle	Duration
	6	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079p	Practical Course in Algorithm Design (p. 192)	4	W/S	6	P. Sanders, D. Wagner, M. Krug

Learning Control / Examinations
The assessment consists of an oral exam according to section 4 subsection 2 no. 2 study and examination regulations. In addition there will be multiple projects and a final presentation.
The grade of the module is the grade of the oral exam.

Conditions
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.

Recommendations
The modules *Algorithms II* [IW3INALG2] and *Algorithm Design* [IW3INALGT] are recommended.

Learning Outcomes

Content

Module: Algorithms II [IW3INALG2]

Coordination: Dorothea Wagner, Peter Sanders
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079	Algorithms II (p. 89)	3/1	W	6	P. Sanders

Learning Control / **Examinations**
The assessment consists of a written exam (approx. 120 minutes) according to section 4 subsection 2 no. 1 study and examination regulations.
The grade of the module corresponds to the grade of the written exam.

Conditions
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.

Learning Outcomes
The student

- gains profound insight into the most important aspects of algorithmics

- identifies algorithmic problems in different areas of application and can formulate these in a formal manner

- comprehends and determines the running times of algorithms

- knows fundamental algorithms and data structures and can apply this knowledge to new problems.

Content
This module conveys knowledge of basic theoretical and practical aspects of algorithmics. It covers common methods for the design and analysis of basic algorithmic problems as well as the fundamentals of common algorithmic methods such as approximations algorithms, linear programming, randomized algorithms, parallel algorithms and parameterized algorithms.

Module: Security [IW3INSICH]

Coordination: Jörn Müller-Quade
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24941	Security (p. 239)	3/1	S	6	J. Müller-Quade

Learning Control / Examinations

The assessment consists of a written exam (approx. 60 minutes) according to sec. 4 subsec. 2 no. 1 study and examination regulations.

The grade of the module corresponds to the grade of the written exam.

Conditions

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.

Learning Outcomes

The student

- knows the theoretic background and the basic mechanisms of computer security and cryptography
- understands the mechanisms of computer security and can explain them,
- can read and understand the current scientific papers,
- can evaluate the safety procedures and can recognize hazards,
- can adapt mechanisms of computer security to new environment.

Content

- Theoretical and practical aspects of computer security
- Development of safety goals and classification of threats
- Presentation and comparison of different formal access control models
- Formal description of authentication systems, presentation and comparison of different authentication methods (passwords, biometrics, challenge-response protocols)
- Analysis of typical vulnerabilities in programs and web applications and development of appropriate protective protection methods / avoidance strategies
- Introduction to key management and Public Key Infrastructure
- Presentation and comparison of current safety certifications
- Block ciphers, hash functions, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (e.g., Diffie-Hellman)
- Furthermore, an introduction to provable security is provided, which presents some of the key security concepts (e.g. IND-CCA).
- Presentation of combinations of cryptographic modules using currently used protocols such as Secure Shell (SSH) and Transport Layer Security (TLS).

Module: Public Key Cryptography [IW3INPKK]

Coordination: Jörn Müller-Quade
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	1

Learning Control / Examinations

Conditions
None.

Learning Outcomes

- The student will learn the methods and mechanisms of cryptography in practice as well as the theoretical foundations of cryptography.
- The student should be able to critically assess algorithms and protocols and to identify vulnerabilities / threats.

Content

- This module will show the students the theoretical and practical aspects of Pubic Key Cryptography.
- The most important primitives of cryptography will be covered: one-way function, hash function, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (eg, Diffie-Hellman) with their strengths and weaknesses.
- In addition to public-key systems, the module provides knowledge about number-theoretic algorithms for solving problems such as primality testing, factoring large numbers and computing discrete logarithms in finite groups. Thus the choice of parameters and the related level of security of a cryptographic system can be estimated.
- Furthermore, an introduction to provable security is provided, which presents some of the key security concepts (eg, IND-CCA).
- The combination of cryptographic modules will be treated using the example of currently used protocols such as Secure Shell (SSH), Transport Layer Security (TLS) and anonymous digital money.

Module: Software Engineering I [IW3INSWT1]

Coordination: Walter F. Tichy, Ralf Reussner
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24518	Software Engineering I (p. 243)	3/1/2	S	6	W. Tichy, Korbinian Molitorisz

Learning Control / Examinations
The assessment consists of a written exam of 1 h according to section 4 subsection 2 no. 1 study and examination regulations. The grade of this module corresponds to the grade of the written exam.

Conditions
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.
The successful completion of the module *Foundations in Informatic*s [IW1INF1] is required.

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

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

Module: Software Engineering II [IW3INSWT2]

Coordination: Ralf Reussner, Walter F. Tichy
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24076	Software Engineering II (p. 244)	3/1	W	6	R. Reussner, W. Tichy

Learning Control / Examinations

The assessment consists of a written exam (approx. 60 minutes) according to section 4 subsection 2 no. 1 study and examination regulations.

The grade of the module corresponds to the grade of the written exam.

Conditions
None.

Learning Outcomes

Content

Remarks
See German version.
This module will be offered as of the winter term 2010/11.

Module: Programming Paradigms [IW3IWPROGP]

Coordination: Gregor Snelting
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Winter Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24030	Programming Paradigms (p. 200)	3/1	W	6	G. Snelting, R. Reussner

Learning Control / Examinations
The assessment consists of a written exam (approx. 90 minutes) according to sec. 4 subsec. 2 no. 1 study and examination regulations.
The grade of the module is the grade of the written exam.

Conditions
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.
Successful completion of the module *Software Engineering I* [IW3INSWT1].

Learning Outcomes

Content

Module: Advanced object orientation [IW3INFOO]

Coordination: Gregor Snelting
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
FOO	Advanced object orientation (p. 136)	3/2	S	6	G. Snelting

Learning Control / Examinations
The assessment consists of an oral exam (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.
The grade of the module corresponds to the grade of the oral exam.

Conditions
This is not a lecture on object-oriented software development! Rather, knowledge of object-oriented software engineering (e.g. Java, UML, Design Patterns) is required.

Recommendations
Good knowledge of Java

Learning Outcomes
Participants in this course know the basics of different object oriented programming languages (e.g. Java, C#, Smalltalk, Scala). They know how inheritance and dynamic dispatch work, behave and are implemented, and how these are used in software engineering. They know innovative language constructs in objects oriented languages like generics, aspects and traits. The participants know the theoretic foundations of (e.g. type systems), software engineering tools for (e.g. refactoring) and techniques (e.g. points-to analysis) for analysing object oriented programs. They know current trends in research on object oriented programming

Content

- Behaviour and semantics of dynamic dispatch
- Implementation of single and multiple inheritance
- Genericity, refactoring
- Aspect oriented programming
- Traits and mixins, virtual classes
- Cardelli's type system
- Palsberg-Schwartzbach type inference
- Analyses on the call graph, points-to analyses
- operational semantics, type safety
- bytecode JVM, bytecode verifier, dynamic compilation

Remarks
The module is not lectured in the summer term 2010.

Module: [IW3INRS]

Coordination: Wolfgang Karl
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every 2nd term, Summer Term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24570	(p. 208)	3/1	S	6	J. Henkel, W. Karl

Learning Control / Examinations

The assessment consists of a written exam (approx. 60 minutes) according to section 4 subsection 2 no. 1 study and examination regulations.
The grade of the module corresponds to the grade of the written exam.

Conditions

None.

Learning Outcomes

Content

Module: [IW3INEBS]

Coordination: Frank Bellosa, Jörg Henkel
Degree programme: Informationswirtschaft (B.Sc.)
Subject: Informatics (Specialization)

ECTS Credits	Cycle	Duration
6	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24127	(p. 187)	2	W	3	F. Bellosa
24181	(p. 188)	2	W	3	F. Bellosa, Merkel
24672	(p. 161)	2	S	3	J. Henkel
LPD	(p. 191)	2	S	3	J. Henkel

Learning Control / Examinations

The assessment consists of an oral exam on the taken lectures and practical courses (approx. 30 minutes) according to section 4 subsection 2 no. 2 study and examination regulations.
Practical course: In addition the student needs to submit a certificate (not graded) of the practical course as an assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations.
The grade of the module corresponds to the grade of the oral exam.

Conditions

The following combinations can be taken:
- lecture *Low Power Design* and *Power Management*
- lecture *Low Power Design* and *Praktikum Low Power Design*
- lecture *Power Management* and *Power Management Praktikum*

Learning Outcomes

Content

- CPU Power Management
- Memory Power Management
- I/O Power Management
- Battery Power Management
- Cluster Power Management

6   Courses

6.1   All Courses

Course: Advanced Topics in Economic Theory [25527]

Coordinators: Clemens Puppe, Marten Hillebrand, Kay Mitusch
Part of the modules: Microeconomic Theory (p. 56)[IW3VWL6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	en

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content
The focus of the course is the modern economic theory of (general) equilibrium. The course is divided into three parts. The first part introduces the microeconomic foundations of general equilibrium á la Debreu ("The Theory of Value", 1959) and Hildenbrand/Kirman ("Equilibrium Analysis",1988). The second part considers dynamic (stochastic) equilibrium models with a particular focus on the overlapping generations model which lie at the heart of modern macroeconomics. The third part deals with asymmetric information and introduces the basic models based on Akerlof's "Market for Lemons." The course is largely based on the textbook "Microeconomic Theory" (Chapters 1-5, 10, 13-20) by A.Mas-Colell, M.D.Whinston, and J.R.Green

Literature
The course is based on the excellent textbook "Microeconomic Theory" (Chapters 1-5, 10, 13-20) by A.Mas-Colell, M.D.Whinston, and J.R.Green

Remarks
The lecture will be offered in the summer term 2010 for the first time.
Up to now, the lecture was named *Advanced Microeconomic Theory.*

Course: Algorithm Engineering [24123]

Coordinators: Peter Sanders, Dorothea Wagner
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
Lecture *Algorithmn Design*

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, scientific papers, source codes

Literature
Elective literature:

- K. Mehlhorn, P. Sanders, Algorithms and Data Structures - The Basic Toolbox, Springer 2008

Remarks
This course is offered irregularily.

Course: Algorithms for Planar Graphs [24614]

Coordinators: Dorothea Wagner
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2/1	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Basic knowledge of graph theory and algorithm design is helpful.

Learning Outcomes
The lecture aims at providing students with an overview on the field of planar graphs and especially focuses on algorithmic aspects. The students obtain a systematic understanding of the central concepts and techniques for tackling algorithmic questions on planar graphs, which builds upon the students' knowledge in the areas of graph theory and algorithmics. In this course problems are reduced to their algorithmic core and are afterwards, if possible from a complexity theoretical point of view, solved efficiently. The students learn to apply the presented methods and techniques autonomously to related problems. With the obtained knowledge they are able to to work on current reasearch problems in the area of planar graphs

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

Media
Blackboard, script.

Literature
Elective literature:
Takao Nishizeki and Norishige Chiba. Planar Graphs: Theory and Algorithms, volume 32 of Annals of Discrete Mathematics. North-Holland, 1988.

Course: Algorithms I [24500]

Coordinators: Peter Sanders
Part of the modules: Algorithms I (p. 16)[IW2INF2]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1/2	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes
The student is supposed to

- know and understand basic, frequently used algorithms, their conception, analysis of their correctness and efficiency, implementation, documentation and application
- be able to use their comprehension to work on new algorithmic problems
- apply the knowledge acquired in the module *Grundlagen der Informatik* (B.Sc. Information Engineering and Management) to non-trivial algorithms
- apply the knowledge acquired in the module *Grundbegriffe der Informatik* (Bachelor Informatics) or in *Grundlagen der Informatik* (B.Sc. Information Engineering and Management) and the mathematical methodologies learned in the mathematics lectures to solve problems, the focus being on both formal correctness arguments and mathematical efficiency analysis

Content
The module contains the „basic toolbox for algorithmics". The following topics are covered in particular:

- result analysis (checkers) and certification
- asymptotic algorithm analysis: worst case, average case, probabilistic, amortised
- basic terms of algorithm engineering
- efficient application of linked lists
- unlimited arrays, batches and queues
- hash tables: with linking, linear probing, universal hashing
- sorting: efficient algorithms (mergesort, quicksort), lower border, radix sort
- selection: quickselect
- sorted sequences/search trees: How to support all important operations within logarithmic time?
- graphs (representation, traversing: breadth search, deep search, applications (topological sorting,...), shortest path: Dijkstra's algorithm, Bellman-Ford algorithm, minimum spanning trees: Kruskals algorithm, Jarnik-Prim algorithm)
- generic optimisation algorithms (greedy, dynamic programming, systematic search, local search)

Media
slides, blackboard

Literature
Algorithms and Data Structures – The Basic Toolbox
K. Mehlhorn und P. Sanders
Springer 2008
Elective 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: Algorithms II [24079]

Coordinators: Peter Sanders
Part of the modules: Algorithms II (p. 75)[IW3INALG2]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Winter term	de

Learning Control / Examinations
The assessment consists of a written exam (approx. 120 minutes) according to section 4 subsection 2 no. 1 study and examination regulations.

Conditions
See module description.

Learning Outcomes
The student

- gains profound insight into the most important aspects of algorithmics
- identifies algorithmic problems in different areas of application and can formulate these in a formal manner
- comprehends and determines the running times of algorithms
- knows fundamental algorithms and data structures and can apply this knowledge to new problems.

Content
This course conveys knowledge of basic theoretical and practical aspects of algorithmics. It covers common methods for the design and analysis of basic algorithmic problems as well as the fundamentals of common algorithmic methods such as approximations algorithms, linear programming, randomized algorithms, parallel algorithms and parameterized algorithms.

Course: Algorithms for Visualization of Graphs [24118]

Coordinators: Dorothea Wagner, R. Görke
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Basic knowledge of graph theory and algorithmics is helpful.

Learning Outcomes
The students acquire a systematic understanding of algorithmic problems and solutions in the area of graph visualization, which builds upon existing knowledge in graph theory and algorithmics. The problems at hand are reduced to their algorithmic core and are subsequently solved efficiently – if possible from the complexity point-of-view. The students learn to apply the presented methods and techniques autonomously to related questions. They are enabled to work on current research questions in graph drawing.

Content
Networks are relational data that increasingly occur in various applications. Examples range from physical networks, for example, transport or supply networks, to abstract networks, for example, social networks. Network visualization is a basic tool to explore and understand such networks.

Mathematically, networks are modeled as graphs and the visualization problem reduces to the algorithmic core problem of finding a suitable graph layout, that is, determining the positions of vertices and edges in the plane. Depending on the application and the properties of the graph at hand different constraints and optimization criteria apply. The corresponding research area of graph drawing uses approaches from algorithmics, graph theory, and computational geometry.

In the course of the lecture, a representative selection of visualizationalgorithms is presented.

Media
Blackboard, slides, script.

Literature
Elective literature:

- Di Battista, Eades, Tamassia, Tollis: Graph Drawing, Prentice Hall 1999

- Kaufmann, Wagner: Drawing Graphs, Springer-Verlag, 2001

Course: Algorithmic Methods for Hard Optimization Problems [AlgoMO]

Coordinators: Dorothea Wagner, Peter Sanders
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowledge of the lecture *Algorithmentechnik* [24079] is recommended.

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

Content
There are many practical problems that cannot be solved optimally - some not at all and some not in a resonable amount of time. An example is the "bin packing problem" where a collection of objects must be packed using a possibly small number of bins. Moreover, problems sometimes arise where knowledge about the future (or even about the present) is incomplete, but a decision is required neverthelss ("online problems"). Regarding bin packing, for example, there must be a point in time when you close the bins and send them away. Even if there are some more objects arriving later.

Remarks
This lecture is currently not offered.

Course: Algorithms for Internet Applications [25702]

Coordinators: Hartmut Schmeck
Part of the modules: Algorithms and Applications (p. 67)[IW3INAIFB5], Information Services in Networks (p. 66)[IW3INAIFB4]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	en

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).

Conditions
credits for all the Informatics modules of years 1 and 2 (except for at most one module).

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

Literature

- Tanenbaum: Computer Networks, 4th edition, Prentice-Hall 2003.

- Baeza-Yates, Ribeiro-Neto: Modern Information Retrieval. Addison-Wesley, 1999.

- Wobst: Abenteuer Kryptologie : Methoden, Risiken und Nutzen der Datenverschlüsselung, 3rd edition. Addison-Wesley, 2001.

- Schneier: Applied Cryptography, John Wiley, 1996.

- Furche, Wrightson: Computer money : Zahlungssysteme im Internet [Übers.: Monika Hartmann]. - 1. Aufl. - Heidelberg : dpunkt, Verl. für Digitale Technologie, 1997.

Elective literature:

- Further references will be given in the course.

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

Coordinators: Wolfgang Gaul, Thomas Lützkendorf, Andreas Geyer-Schulz, Christof Weinhardt, Thomas Burdel-
ski
Part of the modules: Business Administration (p. 21)[IW1BWL2]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0/2	Summer term	de

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

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 aquisitions, 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 competetive factor that calls for an interdisciplinary investigation from economics and business administration, informatics and law. In this part of the lecture, selected topics from information engineering and management and their impact in market competition are presented
Topics include: Information in a company, Information processing: From an agent to business networks, social networks, service value networks, complex service auction, market engineering, grid und cloud computing, dynamic pricing, fundamentals of trading and market efficiency on stock exchanges.

Literature
Further literature references are announced in the materials to the lecture.

Remarks
Key qualifications can be shown in an active participation through presentations of solutions and discussions in the tutorials which accompany the course. Each part of the course is taught by instructors specialised in the field of that part.

Course: Business Administration and Management Science C [25026/25027]

Coordinators: Hagen Lindstädt, Martin E. Ruckes, Marliese Uhrig-Homburg, Thomas Burdelski
Part of the modules: Business Administration (p. 21)[IW1BWL2]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0/2	Winter term	de

Learning Control / Examinations

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 und 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 und provides a modern introduction to the theory und practice of capital raising and capital budgeting.
These topics are covered:

- Valuation of financial und 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 fulfils the coordinating task within the management system in an essential way.
These topics are covered:

- Fundamentals of controlling und 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 und reporting)

Literature
Extensive bibliographic information will be given in the materials to the lecture.

Remarks
Key qualifications can be shown in an active participation through presentations of solutions and discussions in the tutorials which accompany the course. Each part of the course is taught by instructors specialised in the field of that part.

Course: Analytical CRM [26522]

Coordinators: Andreas Geyer-Schulz
Part of the modules: Specialization in Customer Relationship Management (p. 40)[IW3BWLISM5], CRM and Service
Management (p. 39)[IW3BWLISM4]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Summer term	de

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:

Grade	Minimum points
1.0	104
1.3	98
1.7	92
2.0	86
2.3	80
2.7	74
3.0	68
3.3	62
3.7	56
4.0	50
4.7	40
5.0	0

Conditions
None.

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

Media
slides

Literature
Ponnia, Paulraj. Data Warehousing Fundamentals: A Comprehensive Guide for IT Professionals. Wiley, New York, 2001.
Duda, Richard O. und Hart, Peter E. und Stork, David G. Pattern Classification. Wiley-Interscience, New York, 2. Ausgabe, 2001.

Maddala, G. S. Introduction to Econometrics. Wiley, Chichester, 3rd Ed., 2001.
Theil, H. Principles of Econometrics. Wiley, New York, 1971.

Course: Applied Informatics I - Modelling [25070]

Coordinators: Andreas Oberweis, Rudi Studer, Sudhir Agarwal
Part of the modules: Applied Informatics (p. 19)[IW1INF5]

ECTS Credits	Hours per week	Term	Instruction language
4	2/1	Winter term	de

Learning Control / Examinations

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

Media
Slides.

Literature

- Bernhard Rumpe. Modellierung mit UML, Springer-Verlag, 2004.

- R. Elmasri, S. B. Navathe. Fundamentals of Database Systems. Pearson Education, 4. Aufl., 2004, ISBN 0321204484.

- W. Reisig. Petri-Netze, Springer-Verlag, 1986.

Elective literature:

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web - Grundlagen, Springer, 2008 (ISBN 978-3-540-33993-9)

- Staab, Studer: Handbook on Ontologies, Springer, 2003

- J.L. Peterson: Petri Net Theory and Modeling of Systems, Prentice Hall, 1981.

- Franz Baader, Diego Calvanese, Deborah McGuinness, Daniele Nardi, Peter Patel-Schneider. The Description Logic Handbook - Theory, Implementation and Applications, Cambridge 2003.

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

Coordinators: Stefan Tai
Part of the modules: Applied Informatics (p. 19)[IW1INF5]

ECTS Credits	Hours per week	Term	Instruction language
4	2/1	Summer term	de

Learning Control / Examinations

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

Learning Outcomes
The student learns about IT methods and systems in support of modern electronic commerce. The student should be able to select, asess, 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.

Literature
Tba in the lecture.

Course: Topics of Sustainable Management of Housing and Real Estate [26420]

Coordinators: Thomas Lützkendorf
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment of this course is (according to §4(2), 3 SPO) in form of an examination of the written seminar thesis and a presentation.

Conditions
None.

Learning Outcomes

- Students autonomously compile a paper treating of a marked-off subject within the area of real estate economics respectively sustainable construction, and present their results within the seminar.

- Therefore they master the principles of scientific writing, especially research, reasoning and citation, as well as handling information suspiciously.

- Through own and observed experiences they develop the ability to hold scientific presentations, including technical, formal, rethorical and didactical aspects.

Content
The seminar deals with changing up-to-date topics concerning Real Estate Economics or Sustainable Construction.
Current topics and schedules are announced at the beginning of term.

Media
A reader dealing with the basics of scientific writing is provided (in german language).

Course: Selected Topics in Ergonomics [25934]

Coordinators: Dorothee Karl
Part of the modules: Human Resource Management (p. 53)[IW3BWLIAP1]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER

Conditions
None.

Learning Outcomes

Content

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

Coordinators: Andreas Geyer-Schulz
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 of the examination regulation in form of the written seminar thesis and a presentation.
The final mark is given, if the written seminar thesis was handed in as well as the presentation was held.
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.

Conditions
See module description.

Recommendations
Knowledge from CRM is required. Therefore, the lecture *Customer Relationship Management* [26508] (or a similiar one) has to be attended parallel or before the seminar.

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 formating styles similiar to those of scienfitic publishers.
The seminar treats questions of Customer Relationship Management.

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.
Elective literature:

- W. Thomson. A Guide for the Young Economist. The MIT Press, 2001
- D.J. Brauner, H.-U. Vollmer. Erfolgreiches wissenschaftliches Arbeiten. Verlag Wissenschaft & Praxis, 2004
- University of Chicago Press. The Chicago Manual of Style. University of Chicago Press, 13th ed., 1982
- American Psychological Association. Concise of Rules of APA Style. American Psychological Association, 2005
- American Psychological Association. Publication Manual of the American Psychological Association. American Psychological Association, 2001

Course: Bachelor Seminar in Foundations of Marketing [25191]

Coordinators: Wolfgang Gaul
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter / Summer Term	de

Learning Control / Examinations

Conditions
Knowledge like it is provided in the course *Foundations of Marketing* [WI3BWLMAR] is assumed.

Learning Outcomes

Content

Course: Bank Management and Financial Markets, Applied Econometrics [25355]

Coordinators: Karl-Heinz Vollmer
Part of the modules: Statistical Applications of Financial Risk Management (p. 58)[IW3VWL]

ECTS Credits	Hours per week	Term	Instruction language
5	2/2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

Literature

- Bierwag: Duration-Analysis; Managing Interest Rat Risk, 1987
- Andrew Harvey: The Econometric Analysis of Time Series, 2nd. Ed. 1993
- Andrew Harvey: Time Series Models, 2nd. Ed. 1994
- Granger/Newbold: Forecasting Economic Time Series; 2nd. Ed. 1986
- Pindyck, Rubinfeld: Econometric Models and Economic Forecasts, 1998
- B. Rolfes: Gesamtbanksteuerung, 1999

Course: Design, Construction and Assessment of Green Buildings I [26404w]

Coordinators: Thomas Lützkendorf
Part of the modules: Sustainable Construction (p. 51)[IW3BWLOOW1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Winter term	de

Learning Control / Examinations
The assessment consists of an oral exam (20 min.) according to Section 4 (2), 2 of the examination regulation.
The oral exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

Conditions
A combination with the module *Real Estate Management* [IW3BWLUO1] and with engineering science modules in the area of building physics and structural design is recommended.

Learning Outcomes
Knowledge in the area of sustainable construction concerning whole buildings, building components, equipment and appliances as well as building material.

Content
Taking low-energy buildings as an example the course is an introduction to cheap, energy-efficient, resource-saving and health-supporting design, construction and operation of buildings. Questions of the implementation of the principles of a sustainable development within the building sector are discussed on the levels of the whole building, its components, building equipment as well as the materials. Besides technical interrelationships basics dimensioning and various approaches to ecological and economical assessment play a role during the lectures, as well as the different roles of people involved into the building process. Topics are the integration of economical and ecological aspects into the design process, strategies of energy supply, low-energy and passive buildings, active and passive use of solar energy, selection and assessment of construction details, selection and assessment of insulation materials, greened roofs plus health and comfort.

Media
For a better clearness videos and simulation tools will be presented during the lectures.

Literature
Elective literature:
See german version.

Course: Sustainability Assessment of Construction Works [26404]

Coordinators: Thomas Lützkendorf
Part of the modules: Sustainable Construction (p. 51)[IW3BWLOOW1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Summer term	de

Learning Control / Examinations
The assessment consists of a written or an oral exam (20 min.) according to Section 4 (2), 1 or 2 of the examination regulation. The exam takes place at every semester. Re-examinations are offered at every ordinary examination date.

Conditions
A combination with the module *Real Estate Management* [IW3BWLOOW2] and with engineering science modules from the areas building physics and structural designis recommended.

Learning Outcomes
Knowledge in the area of economic and wnvironmental assesment of construction works.

Content
The course identifies problems concerning the economical and environmental assessment of buildings along their lifecycle and discusses suitable procedures and tools supporting the decision making process. For example, the course addresses topics like operating costs, heat cost allocation, comparisons of heating costs, applied economical assessment methods, life cycle assessment as well as related design and assessment tools (e.g. element catalogues, databases, emblems, tools) and assessment procedures (e.g. carbon footprint, MIPS, KEA), which are currently available.

Literature
Elective literature:
See german version.

Course: Civil Law for Beginners [24012]

Coordinators: Thomas Dreier, Peter Sester
Part of the modules: Introduction to Civil Law (p. 25)[IW1JURA1]

ECTS Credits	Hours per week	Term	Instruction language
4	4/0	Winter term	de

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

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 basiscs 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

Literature
Tba at the beginning of the course,
Elective literature:
Tba at the beginning of the course,

Course: Advanced Civil Law [24504]

Coordinators: Thomas Dreier, Peter Sester
Part of the modules: Commercial Law (p. 26)[IW1JURA2]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Summer term	de

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

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

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

Literature
Tba at the beginning of the course.
Elective literature:
tba at the beginning of the course

Course: Exchanges [25296]

Coordinators: Jörg Franke
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5], eFinance (p. 38)[IW3BWLISM3]

ECTS Credits	Hours per week	Term	Instruction language
1.5	1	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students learn about current developments regarding organisation of exchanges and securities trading.

Content

- Organisation of exchanges: Changing Zeitgeist - Corporates instead of cooparative structures
- Market models: order driven vs. market maker - Liquidity provision for less frequently traded securities
- Trading systems: The end of an era? - No more need for running traders?
- Clearing: Diversity instead of uniformity - Safety for all?
- Settlement: Increasing importance - Does efficient settlement assure the "value added" of exchanges in the long run?

Literature
Elective literature:
Educational material will be offered within the lecture.

Course: Cloud Computing [25776]

Coordinators: Stefan Tai, Kunze
Part of the modules: Information Services in Networks (p. 66)[IW3INAIFB4], Web Information Systems
                          (p. 63)[IW3INAIFB1]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The course introduces concepts, methods, and techniques of Cloud Computing for providing and consuming IT resources, development- and runtime environments, and software applications of all kinds as Web services.

Content
Building on compute and storage virtualization, Cloud Computing provides scalable, network-centric, abstracted IT infrastructure, platforms, and software applications as on-demand services that are billed by consumption. Innovative business models, cost efficiency, and time-to-market are further promises associated with Cloud Computing. The lecture introduces Cloud Computing, covering topics such as:
- Fundamentals: Virtualization, Service-orientation
- Commercial and Open-Source Cloud offerings
- Cloud service engineering
- Web-scale Cloud service architecture
- Cloud service management
- Cloud economics
- Obstacles and opportunities

Literature
Cloud Computing: Web-basierte dynamische IT-Services, von C. Baun, M. Kunze, J. Nimis, S. Tai. Springer-Verlag 2009.

Course: Current Issues in the Insurance Industry [26350]

Coordinators: Wolf-Rüdiger Heilmann
Part of the modules: Insurance Markets and Management (p. 49)[IW3BWLFBV4]

ECTS Credits	Hours per week	Term	Instruction language
2.5	2/0	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam (according to Section 4 (2), 1 of the examination regulation) .
The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Conditions
For the understanding of this course knowledge of *Private and Social Insurance* [25050] is required.

Learning Outcomes
Knowledge and understanding of important current characteristics of insurance, e.g. insurance markets, lines, products, investment, company pension schemes, corporate structures and governance as well as controlling.

Content
Current topics in insurance markets.

Literature
Elective literature:
Schwebler, Knauth, Simmert. Kapitalanlagepolitik im Versicherungsbinnenmarkt. 1994
Seng. Betriebliche Altersversorgung. 1995
von Treuberg, Angermayer. Jahresabschluss von Versicherungsunternehmen. 1995

Remarks
Block course. To attend the course please register at the secretay of the chair of insurance science.

Course: Customer Relationship Management [26508]

Coordinators: Andreas Geyer-Schulz
Part of the modules: CRM and Service Management (p. 39)[IW3BWLISM4]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Winter term	en

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:

Grade	Minimum points
1.0	104
1.3	98
1.7	92
2.0	86
2.3	80
2.7	74
3.0	68
3.3	62
3.7	56
4.0	50
4.7	40
5.0	0

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, Audio, Reader

Literature
Christian Grönroos. Service Management and Marketing : A Customer Relationship Management Approach. Wiley, Chichester, 2nd edition, 2000.
Elective literature:
Jill Dyché. The CRM Handbook: A Business Guide to Customer Relationship Management. Addison-Wesley, Boston, 2nd edition, 2002.
Ronald S. Swift. Accelerating Customer Relationships: Using CRM and RelationshipTechnologies. Prentice Hall, Upper Saddle River, 2001.
Stanley A. Brown. Customer Relationship Management: A Strategic Imperative in theWorld of E-Business. John Wiley, Toronto, 2000.

Course: Data Mining [25375]

Coordinators: Gholamreza Nakhaeizadeh
Part of the modules: Statistical Applications of Financial Risk Management (p. 58)[IW3VWL]

ECTS Credits	Hours per week	Term	Instruction language
5	2	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content
Part one: Data Mining
Why Data Mining?

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

Part two: Examples of application of Data Mining

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

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

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

Course: Data Warehousing and Mining [24114]

Coordinators: Klemens Böhm
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

Learning Control / Examinations
The assesment is performed according to section 4 subsection 2 no. 3 of the study and examination regulations and requires active participation in the excercises.

Conditions
This course cannot be combined with the courses *Knowledge Discovery* [25742] and/or *Data Mining* [25375].

Recommendations
Knowledge about database systems, e.g. from the lecture *Database Systems*

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.

Literature

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

Elective literature:
Further literature will be mentioned at the end of each chapter in the lecture slides.

Remarks
From October 2010 the oral exam is offered to students only who failed the first exam.

Course: Deployment of Database Systems [24647]

Coordinators: Klemens Böhm
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	de

Learning Control / Examinations
It will be announced at least 6 weeks in advance if the assessment consists of an 1h written exam according to section 4 subsection 2 no. 1 study and examination regulations or of a 20 minute oral exam according to section 4 subsection 2 no. 2 study and examination regulations.

Conditions
Knowledge about database systems, e.g., from the lecture *Database Systems* [24516] and *Introduction in Computer Networks* [24519].

Learning Outcomes
At the end of the course, the participants should be able to explain and compare database concepts (especially data models and query languages) – in more breadth, compared to database courses at the undergraduate level. They should know and be able to assess the different possibilities to store complex user data using database technology.

Content
This course introduces students to the deployment of modern database technology, in both breadth and depth. 'Breadth' is reached by the detailed study and comparison of different data models (especially the relational and the semi-structured/XML data models) and appropriate query languages (SQL, XQuery). 'Depth' is reached by the study of several non-trivial applications, such as management of XML or e-commerce data, implementation of retrieval-models using relational database technology, or the usage of SQL for accessing sensor networks. Since all these applications are generic problems themselves, the study of such applications is interesting in itself already.

Media
Slides.

Literature

- Andreas Heuer, Gunther Saake: Datenbanken - Konzepte und Sprachen. 2. Aufl., mitp-Verlag, Bonn, Januar 2000.

- Alfons Kemper, Andre Eickler: Datenbanksysteme. 6. Aufl., Oldenbourg Verlag, 2006.

Elective literature:

- Hector Garcia-Molina, Jeffrey D. Ullman, Jennifer Widom: Database Systems: The Complete Book. Prentice Hall, 2002

- Ramez Elmasri, Shamkant B. Navathe: Fundamentals of Database Systems.

Course: Database Systems [24516]

Coordinators: Klemens Böhm
Part of the modules: Communication and Database Systems (p. 70)[IW3INKD]

ECTS Credits	Hours per week	Term	Instruction language
4	2/1	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
It is recommended but not mandatory to attend lectures covering communication networks, system architecture and software engineering.

Learning Outcomes
The student

- is able to explain the benefits of database technology,

- has understood the development of database applications including its models and methods,

- is able to set up and query simple databases,

- is familiar with the terminology and the fundamentals of the underlying theory.

Content
Database systems are one of the crucial software fundamentals in modern information systems. Therefore, they belong to the core subjects in university curriculums in the area of computer science. The goal of the lecture is to obtain the basic knowledge to work with database systems. Key aspects are database models for design and implementation (ER models, relational model), languages for database systems (SQL) and its theoretical foundation (relational algebra) as well as aspects of transaction processing, data integrity and views.

Media
Slides.

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, 7. Aufl., Oldenbourg Verlag, 2009

Elective literature:

- S. Abeck, P. C. Lockemann, J. Seitz, J. Schiller: Verteilte Informationssysteme, dpunkt-Verlag, 1. Aulage,2002, ISBN-13: 978-3898641883

- R. Elmasri, S.B. Navathe: Fundamentals of Database Systems, 4. Auflage, Benjamin/Cummings, 2000.

- Gerhard Weikum, Gottfried Vossen: Transactional Information Systems, Morgan Kaufmann, 2002.

- C. J. Date: An Introduction to Database Systems, 8. Auflage, Addison-Wesley, Reading, 2003.

Course: Data Privacy Protection in Interconnected Information Systems [24605]

Coordinators: Klemens Böhm, Buchmann
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations
It will be announced in advance if the assessment consists of an 1h written exam according to section 4 subsection 2 no. 1 study and examination regulations or of a 20 minute oral exam according to section 4 subsection 2 no. 2 study and examination regulations.

Conditions
Knowledge about database systems, distributed information systems, system architecture and communication infrastructures, e.g. from the lectures *Database Systems* [24516] and *Introduction in Computer Networks* [24519].

Learning Outcomes
At the end of the lecture, the participants are aware of the objectives and basic principles of informational self-determination. The participants are able to name and explain the fundamental challenges and impacts of data privacy protection for both individuals and society. Furthermore, the participants are expected to know and to apply current methods and technologies for data privacy protection, e.g., spatial and temporal cloaking. The objective of the lecture is to enable the participants to assess and analyze the risks of unknown technologies towards privacy, to propose methods that can be expected to deal with such risks, and to measure the effectiveness of the methods proposed.

Content
This lecture is intended to explain the impacts of interconnected information systems on data privacy. The lecture addresses both current information systems that can be observed on the Internet and information systems that are under development yet. In order to tackle these challenges, a number of technical methods have been proposed and discussed in research and practice. The lecture introduces such approaches, and points out how effective they are in ensuring data privacy. An examination of the social implications of data privacy challenges and privacy enhancing technologies concludes the lecture.

Media
lecture slides

Literature
Will be announced in the lecture.

Course: Data Protection Law [24018]

Coordinators: Indra Spiecker genannt Döhmann
Part of the modules: Intellectual Property and Data Protection (p. 35)[IW3JURA]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter term	de

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

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. Oranisational 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

Literature
Will be announced in the course.
Elective literature:
Wil 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: Derivatives [26550]

Coordinators: Marliese Uhrig-Homburg
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5], eFinance (p. 38)[IW3BWLISM3]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations

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

Literature

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

Elective literature:
Cox/Rubinstein (1985): Option Markets, Prentice Hall

Course: Efficient Algorithms [25700]

Coordinators: Hartmut Schmeck
Part of the modules: Algorithms and Applications (p. 67)[IW3INAIFB5]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	de

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 periodwrt (§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.

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

Learning Outcomes
The student will learn how to use methods and concepts of ëfficient algorithmsänd 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)

Literature
Akl, S.G.: The Design and Analysis of Parallel Algorithms. Prentice-Hall, Englewood Cliffs, New Jersey,1989.
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)
Elective literature:
will be announced in class

Course: eFinance: Information Engineering and Management for Securities Trading [26454]

Coordinators: Christof Weinhardt, Ryan Riordan
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5], eFinance (p. 38)[IW3BWLISM3], eBusiness and Servicemanagement (p. 36)[IW3BWLISM1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

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

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 make 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

Literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhrl (1996): "Börsen im Wandel". Knapp, Frankfurt

- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners"". Oxford University Press, New York

Elective literature:

- Gomber, Peter (2000): "Elektronische Handelssysteme - Innovative Konzepte und Technologien". Physika Verlag, Heidelberg

- Schwartz, Robert A., Reto Francioni (2004): "Equity Markets in Action - The Fundamentals of Liquidity, Market Structure and Trading". Wiley, Hoboken, NJ

Course: Introduction to Operations Research I [25040]

Coordinators: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann
Part of the modules: Introduction to Operations Research (p. 23)[IW1OR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2/2	Summer term	de

Learning Control / Examinations
See module description.

Conditions
See module information.

Learning Outcomes
See module informaion.

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.

Literature
Lecture notes
Elective literature:

- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005

- Murty: Operations Research. Prentice-Hall, 1995

- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006

- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

- Büning, Naeve, Trenkler, Waldmann: Mathematik für Ökonomen im Hauptstudium. Oldenbourg, 2000

Course: Introduction to Operations Research II [25043]

Coordinators: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann
Part of the modules: Introduction to Operations Research (p. 23)[IW1OR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2/2	Winter term	de

Learning Control / Examinations
See module description.

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

Learning Outcomes
See module information.

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

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

Literature
Lecture notes
Elective literature:

- Hillier, Lieberman: Introduction to Operations Research, 8th edition. McGraw-Hill, 2005

- Murty: Operations Research. Prentice-Hall, 1995

- Neumann, Morlock: Operations Research, 2. Auflage. Hanser, 2006

- Winston: Operations Research - Applications and Algorithms, 4th edition. PWS-Kent, 2004

- Büning, Naeve, Trenkler, Waldmann: Mathematik für Ökonomen im Hauptstudium. Oldenbourg, 2000

Course: Introduction to Energy Economics [26010]

Coordinators: Wolf Fichtner
Part of the modules: Energy Economics (p. 45)[IW3BWLIIP2]

ECTS Credits	Hours per week	Term	Instruction language
5.5	2/2	Summer term	de

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

Conditions
None.

Learning Outcomes

Content

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

Course: Introduction to Information Engineering and Management [26490]

Coordinators: Christof Weinhardt, Andreas Geyer-Schulz
Part of the modules: Foundations in Business Administration (p. 20)[IW1BWL1]

ECTS Credits	Hours per week	Term	Instruction language
4	2/2	Summer term	de

Learning Control / Examinations
Assessment consists of a written exam of 1 hour length following §4 (2), 1 of the examination regulation and by submitting working exercise following §4 (2), 3 of the examination regulation.
The assessment consists of two parts:

- Examination in written form with a duration of 60 minutes and 80 points
- Working exercise: 20 points.

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

Grade	Minimal Points for Grade
1.0	87
1.3	83
1.7	79
2.0	75
2.3	71
2.7	67
3.0	63
3.3	59
3.7	55
4.0	> 50
4.7	40
5.0	0

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 informations as source for economic decision support.
- 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
- Information for economic decision support.
- Organizing information flows, valuation of information

- Network Economies
- Service Engineering
- Electronic markets
- Logistics/SCM
- Web/Internet-Marketing
- Production and Procurement

Media
Web, Audio/Slides, Full Text Documents.

Literature

- Shapiro, C. and Varian, H.R., (1999) Information rules: a strategic guide to the network economy, Harvard Business School Press
- Fensel, D. et al. (2001) Product data integration in B2B e-commerce, IEEE Intelligent Systems, 16(4). Pages 54–59.
- Kotler (1980) Marketing Management - Analysis, Planning and Control. Prentice-Hall, Englewood Cliffs, 4th Edition. Pages 3–92.
- Porter (1998) Competitive Advantage: Creating and Sustaining Superior Performance. Free Press, New York. Pages 33–53.
- Sterman (2000) Business Dynamics: Systems Thinking and Modeling for a Complex World. McGraw-Hill, Boston. Chapters 4, 5.1, 5.2, 5.3, and 5.5. Pages 107–133, 137–159, 169–177.

Elective literature:

- Geyer-Schulz (1998) Fuzzy Genetic Algorithms. In: Hung T. Nguyen and Michio Sugeno (Eds.) Fuzzy Systems: Modeling and Control, Kluwer Academic Publishers, Boston. Pages 403–460.
- Porter (1998) Competitive Advantage: Creating and Sustaining Superior Performance. Free Press, New York. Pages 62-118.
- Senge (1994) The Fifth Discipline: The Art and Practice of the Learning Organization. Currency/Doubleday, New York. Chapters 2 and 3. Pages 17–54.
- Sterman (1989) Modeling Managerial Behavior: Misperceptions of Feedback in a Dynamic Decision Making Experiment, Management Science, 35(3). Pages 321–339.

Course: Introduction in Computer Networks [24519]

Coordinators: Hannes Hartenstein
Part of the modules: Communication and Database Systems (p. 70)[IW3INKD], Telematics (p. 71)[IW3INTM]

ECTS Credits	Hours per week	Term	Instruction language
4	2/1	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
It is recommended but not mandatory to attend lectures covering system architecture and software engineering.

Learning Outcomes

Content
Today's Internet is arguably the most well-known and most complex artefact ever created by mankind: hundreds of millions connected
computers and connecting networks. Millions of users who connect at any time to the Internet via various devices such as mobile phones, PDAs or laptops. Given the large scale as well as the diversity of the Internet, the question arises to which extent it is possible to understand the complex structures behind. Here, this lecture tries to provide an introduction to the world of computer networks by presenting theoretical and practical aspects of computer networks. Therefore, it covers basics of telecommunications engineering, fundamental protocol mechanisms as well as the layers model of current computer networks. Hence, we present all layers starting with the physical medium layer up to the application layer.

Media
Slides.

Literature

- J.F. Kurose, K.W. Ross: Computer Networking - A Top-Down Approach featuring the Internet. Addison-Wesley, 2007.
- W. Stallings: Data and Computer Communications. Prentice Hall, 2006.

Elective literature:

- F. Halsall: Computer Networking and the Internet. Addison-Wesley, 2005.
- P. Lockemann, G. Krüger, H. Krumm: Telekommunikation und Datenhaltung. Hanser Verlag, 1993.
- S. Abeck, P.C. Lockemann, J. Schiller, J. Seitz: Verteilte Informationssysteme. dpunkt-Verlag, 2003

Course: Energy Policy [25959]

Coordinators: Martin Wietschel
Part of the modules: Energy Economics (p. 45)[IW3BWLIIP2]

ECTS Credits	Hours per week	Term	Instruction language
3.5	2/0	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content
The course deals with material and energy policy of policy makers and includes the effects of such policies on the economy as well as the involvement of industrial and other stakeholders in the policy design. At the beginning the neoclassical environment policy is discussed. Afterwards the Sustainable Development concept is presented and strategies how to translate the concept in policy decision follows. In the next part of the course an overview about the different environmental instruments classes, evaluation criteria for these instruments and examples of environmental instruments like taxes or certificates will be discussed. The final part deals with implementation strategies of material and energy policy.

Literature
Will be anounced in the lecture.

Course: Enterprise Architecture Management [25786]

Coordinators: Thomas Wolf
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

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

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.

Literature

- Nolan, R., Croson, D.: Creative Destruction: A Six-Stage Process for Transforming the Organization. Harvard Business School Press, Boston Mass. 1995

- Doppler, K., Lauterburg, Ch.: Change Management. Campus Verlag 1997

- Jacobson, I.: The Object Advantage, Business Process Reengineering with Object Technology. Addison-Wesley Publishing Company, Wokingham England 1994

- Keller, G., Teufel, Th.: SAP R/3 prozessorientiert anwenden. Addison Wesley 1998

- Österle, H.: Business Engineering Bd. 1 und 2. Springer Verlag, Berlin 1995

Course: Enterprise Risk Management [26326]

Coordinators: Ute Werner
Part of the modules: Risk and Insurance Management (p. 48)[IW3BWLFBV3]

ECTS Credits	Hours per week	Term	Instruction language
4.5	3/0	Winter term	de

Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions
None.

Learning Outcomes
Learning to identify, to analyse and to assess business risks; this serves as a basis for strategy and policy design regarding risks and opportunities of an enterprise. Introduction to approaches that allow to consider area-specific risk objectives, risk-bearing capacity and risk acceptance.

Content

1. Concepts and practice of risk management, based on decision theory

2. Goals, strategies and policies for the identification, analysis, assessment and management of risks

3. Insurance as an instrument for loss-financing

4. Selected aspects of risk management: e.g. environmental protection, organizational failure and D&O-coverage, development of a risk management culture

5. Organisation of risk management

6. Approaches for determining optimal combinations of risk management measures considering their investment costs and outcomes.

Literature

- K. Hoffmann. Risk Management - Neue Wege der betrieblichen Risikopolitik. 1985.

- R. Hölscher, R. Elfgen. Herausforderung Risikomanagement. Identifikation, Bewertung und Steuerung industrieller Risiken. Wiesbaden 2002.

- W. Gleissner, F. Romeike. Risikomanagement - Umsetzung, Werkzeuge, Risikobewertung. Freiburg im Breisgau 2005.

- H. Schierenbeck (Hrsg.). Risk Controlling in der Praxis. Zürich 2006.

Elective literature:
Additional literature is recommended during the course.

Remarks
To attend the course please register at the secretariy of the chair of insurance science.
In the winter term 2010/11 the course is held by Dr. Edmund Schwake.

Course: Renewable Energy Sources - Technologies and Potentials [26012]

Coordinators: Wolf Fichtner
Part of the modules: Energy Economics (p. 45)[IW3BWLIIP2]

ECTS Credits	Hours per week	Term	Instruction language
3.5	2/0	Winter term	de

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

Conditions
None.

Learning Outcomes

Content

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

Course: eServices [26466]

Coordinators: Christof Weinhardt, Gerhard Satzger
Part of the modules: eBusiness and Servicemanagement (p. 36)[IW3BWLISM1], Specialization in Customer Relation-
                        ship Management (p. 40)[IW3BWLISM5]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	en

Learning Control / Examinations

Conditions
None.

Learning Outcomes

This course conveys the fundamental knowledge to understand the importance of services in our economy and the impact of information and communication technology (ICT) on existing and emerging service industries. Combining theoretical models with multiple case studies and application scenarios, this course will enable students:
• to understand different service perspectives and apply the general concept of "value co-creation"
• to know and to be able to apply concepts, methods and tools used for the design, engineering and management of eServices
• to be familiar with current research topics
• to gain experience in group work and to improve their presentation skills
• to be exposed to English language in preparation for working in international environments

Content

The world is moving more and more towards "service-led" economies: in developed countries services already account for around 70% of gross value added. In order to design, engineer, and manage services, traditional "goods-oriented" models are often inappropriate. In addition, the rapid development of information and communication technology (ICT) pushes the economic importance of services that are rendered electronically (eServices) and, thus, drives competitive changes: increased interaction and individualization open up new dimensions of "value co-creation" between providers and customers; dynamic and scalable service value networks replace static value chains; digital services can be globally delivered and exchanged across today's geographic boundaries;

Building on a systematic categorization of (e)Services and on the general notion of "value co-creation", we cover concepts and foundations for engineering and managing IT-based services, allowing for further specialization in subsequent KSRI courses. Topics include service innovation, service economics, service modeling as well as the transformation and coordination of service value networks.

In addition, case studies, hands-on exercises and guest lectures will illustrate the applicability of the concepts. English language is used throughout the course to acquaint students with international environments.

Media
PowerPoint slides;

Literature
Elective literature:
Anderson, J./ Nirmalya, K. / Narus, J. (2007), Value Merchants.
Lovelock, C. / Wirtz, J. (2007) Services Marketing, 6th ed.
Meffert, H./Bruhn, M. (2006), Dienstleistungsmarketing, 5. Auflage,
Spohrer, J. et al. (2007), Steps towards a science of service systems. In: IEEE Computer, 40 (1), p. 70-77
Stauss, B. et al. (Hrsg.) (2007), Service Science – Fundamentals Challenges and Future Developments.
Teboul, (2007), Services is Front Stage.
Vargo, S./Lusch, R. (2004) Evolving to a New Dominant Logic for Marketing, in: Journal of Marketing 68(1): 1–17.
Shapiro, C. / Varian, H. (1998), Information Rules - A Strategic Guide to the Network Economy

Course: Experimental Economics [25373]

Coordinators: Siegfried Berninghaus, Kroll
Part of the modules: Applied Game Theory (p. 54)[IW3VWL1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/2	Summer term	de

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.

Conditions
See corresponding module information.

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 empricial validation, this method is applied in political and strategic consulting. The lecture gives an introduction to experimental methods in economics and shows differences to experiments in natural sciences. Scientific studies are used to show exemplary applications.

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

Literature
Elective literature:

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.

- Handbook of Experimental Economics; J. Kagel, A. Roth; Princeton University Press, 1995.

- Experiments in Economics; J.D. Hey; Blackwell Publishers, 1991.

- Experimental Economics; D.D. Davis, C.A. Holt; Princeton University Press, 1993.

- Experimental Methods: A Primer for Economists; D. Friedman, S. Sunder; Cambridge University Press, 1994.

Course: Financial Management [25216]

Coordinators: Martin E. Ruckes
Part of the modules: Essentials of Finance (p. 46)[IW3BWLFBV1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

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

Conditions
None.

Recommendations
Knowledge of the content of the course Business Administration and Management Science C [25026/25027] is recommended.

Learning Outcomes
Students get an comprehensive insight into financing, capital investments of firms and the essentials of valuation.

Content
Analytical methods and theories in the field "Capital investments and financing" with the main focus on:

- Capital Structure
- Dividend policy
- Essentials of valuation
- Investment decisions
- Short term/ long term finance
- Working Capital Management
- Corporate Governance

Literature
Elective literature:

- Ross, Westerfield, Jaffe, Jordan (2008): Modern Financial Management, McGraw-Hill International Edition
- Berk, De Marzo (2007): Corporate Finance, Pearson Addison Wesley

Course: Financial Intermediation [25232]

Coordinators: Martin E. Ruckes
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5]

ECTS Credits	Hours per week	Term	Instruction language
4.5	3	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students are introduced to the theoretical fundamentals of financial intermediation.

Content

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

Literature
Elective literature:

- Hartmann-Wendels/Pfingsten/Weber (2006): Bankbetriebslehre, 4. Auflage, Springer Verlag.
- Freixas/Rochet (1997): Microeconomics of Banking, MIT Press.

Course: Advanced object orientation [FOO]

Coordinators: Gregor Snelting
Part of the modules: Advanced object orientation (p. 81)[IW3INFOO]

ECTS Credits	Hours per week	Term	Instruction language
6	3/2	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
This is not a lecture on object-oriented software development! Rather, knowledge of object-oriented software engineering (e.g. Java, UML, Design Patterns) is required.

Recommendations
Good knowledge of Java

Learning Outcomes
Participants in this course know the basics of different object oriented programming languages (e.g. Java, C#, Smalltalk, Scala). They know how inheritance and dynamic dispatch work, behave and are implemented, and how these are used in software engineering. They know innovative language constructs in objects oriented languages like generics, aspects and traits. The participants know the theoretic foundations of (e.g. type systems), software engineering tools for (e.g. refactoring) and techniques (e.g. points-to analysis) for analysing object oriented programs. They know current trends in research on object oriented programming

Content

- Behaviour and semantics of dynamic dispatch
- Implementation of single and multiple inheritance
- Genericity, refactoring
- Aspect oriented programming
- Traits and mixins, virtual classes
- Cardelli's type system
- Palsberg-Schwartzbach type inference
- Analyses on the call graph, points-to analyses
- operational semantics, type safety
- bytecode, JVM, bytecode verifier, dynamic compilation

Remarks
The course is not lectured in the summer term 2010.

Course: Business Strategies of Banks [25299]

Coordinators: Wolfgang Müller
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students are told the basics of commercial banking.

Content
The management of a bank is in charge of the determination and implementation of business policy - taking into account all relevant endogenous and exogenous factors - that assures the bank's success in the long run. In this context, there exists a large body of banking models and theories which are helpful in describing the success and risk of a bank. This course is meant to be the bridging of banking theory and practical implementation. In the course of the lectures students will learn to take on the bank management's perspective.
The first chapter deals with the development of the banking sector. Making use of appropriate assumptions, a banking policy is developed in the second chapter. The design of bank services (ch. 3) and the adequate marketing plan (ch. 4) are then built on this framework. The operational business of banks must be guided by appropriate risk and earnings management (ch. 5 and 6), which are part of the overall (global) bank management (ch. 7). Chapter eight, at last, deals with the requirements and demands of bank supervision as they have significant impact on a bank's corporate policy.

Literature
Elective literature:

- A script is disseminated chapterwise within the lecture.

- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2000, Bankbetriebslehre, 2. Auflage, Springer

Course: Industrial Property and Copyright Law [24070]

Coordinators: Thomas Dreier
Part of the modules: Intellectual Property and Data Protection (p. 35)[IW3JURA]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter term	de

Learning Control / Examinations

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 sacntions 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 oon 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.

Literature
Ilzhöfer, Volker Patent-, Marken- und Urheberrecht Verlag Vahlen, 7current edition
Elective literature:
Additional literature tba

Course: Global Optimization I [25134]

Coordinators: Oliver Stein
Part of the modules: Applications of Operations Research (p. 59)[IW3OR5], Methodical Foundations of OR (p. 61)[IW3OR6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.
The examination is held in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.
The examination can also be combined with the examination of *Global Optimization II* [25136]. In this case, the duration of the written examination takes 120 minutes.
In a combined examination of *Global Optimization I* [25134] and *Global Optimization II* [25136], upon attaining more then 60% of the exercise points, the grade of the passed examination is improved by a third of a grading step.
In a combined examination of *Global Optimization I* [25134] and *Global Optimization II* [25136], upon attaining more then 60% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Conditions
None.

Learning Outcomes
The student

- knows and understands the fundamentals of deterministic global optimization,

- is able to choose, design and apply modern techniques of deterministic global optimization in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
Part I of the lecture treats methods for global optimization of convex functions under convex constraints. It is structured as follows:

- Introduction, examples, and terminology

- Existence results

- Optimality in convex optimization

- Duality, bounds, and constraint qualifications

- Numerical methods

Nonconvex optimization problems are treated in part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004

- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000

- R. Horst, H. Tuy *Global Optimization* Springer 1996

- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

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

Course: Global Optimization II [25136]

Coordinators: Oliver Stein
Part of the modules: Methodical Foundations of OR (p. 61)[IW3OR6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

Learning Control / Examinations
The assessment of the lecture is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.
The examination is held in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration to the written examinationen is subject to fulfilling the prerequisite.
The examination can also be combined with the examination of *Global Optimization I* [25134]. In this case, the duration of the written examination takes 120 minutes.
In a combined examination of *Global Optimization I* [25134] and *Global Optimization II* [25136], upon attaining more then 60% of the exercise points, the grade of the passed examination is improved by a third of a grading step.
In a combined examination of *Global Optimization I* [25134] and *Global Optimization II* [25136], upon attaining more then 60% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Conditions
None.

Learning Outcomes
The student

- knows and understands the fundamentals of deterministic global optimization,

- is able to choose, design and apply modern techniques of deterministic global optimization in practice.

Content
In many optimization problems from economics, engineering and natural sciences, numerical solution methods are only able to efficiently identify *local* optimizers, while it is much harder to find *globally* optimal points. This corresponds to the fact that by local search it is easy to find the summit of the closest mountain, but that the search for the summit of Mount Everest is rather elaborate.
The global solution of convex optimization problems is subject of part I of the lecture.
Part II of the lecture treats methods for global optimization of nonconvex functions under nonconvex constraints. It is structured as follows:

- Introduction and examples

- Convex relaxation

- Interval arithmetic

- Convex relaxation via αBB method

- Branch and bound methods

- Lipschitz optimization

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt *Numerische Verfahren der konvexen, nichtglatten Optimierung* Teubner 2004

- C.A. Floudas *Deterministic Global Optimization* Kluwer 2000

- R. Horst, H. Tuy *Global Optimization* Springer 1996

- A. Neumaier *Interval Methods for Systems of Equations* Cambridge University Press 1990

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

Course: Basic Notions of Computer Science [24001]

Coordinators: Tanja Schultz
Part of the modules: Foundations in Informatics (p. 15)[IW1INF1]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1/2	Winter term	de

Learning Control / Examinations
The assessment of the module consists of a grade certificate for the exercise according to sec. 4 subsec. 2 no. 3 study and examination regulations and of a written exam (2 hours) according to sec. 4 subsec. 2 no. 1 study and examination regulations. The grade of the module corresponds to the grade of the written exam.

Conditions
None.

Learning Outcomes

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

Content

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

Media
lecture notes, slides (pdf).

Literature
Elective literature:

- Goos: Vorlesungen über Informatik, Band 1, Springer, 2005
- Abeck: Kursbuch Informatik I, Universitätsverlag Karlsruhe, 2005

Course: Fundamentals of Production Management [25950]

Coordinators: Frank Schultmann
Part of the modules: Industrial Production I (p. 44)[IW3BWLIIP1]

ECTS Credits	Hours per week	Term	Instruction language
5.5	2/2	Summer term	de

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER. Exams are offered in every semester and can be re-examined at every ordinary examination date.

Conditions
None.

Learning Outcomes

- Students should describe the tasks of strategic corporate planning.
- Students should be able to use general approaches in order to solve these problems.

Content
This lecture focuses on strategic production management with respect to various economic aspects. Interdisciplinary approaches of systems theory will be used to describe the challenges of industrial production. This course will emphasize the importance of R&D as the central step in strategic corporate planning to ensure future long-term success.
In the field of site selection and planning for firms and factories, attention will be drawn upon individual aspects of existing and greenfield sites as well as existing distribution and supply centres. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.
Medien und Pflichtliteratur: können aus der alten Fassung übernommen werden.

Media
Media will be provided on learning platform.

Literature
will be announced in the course

Course: Commercial and Corporate Law [24011]

Coordinators: Peter Sester
Part of the modules: Commercial Law (p. 26)[IW1JURA2]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter term	de

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

Conditions
None.

Learning Outcomes
Based on the lectures on civil law, the students are provided with an overview of the specifics of commercial transactions, commercial agency and the law of merchants. Moreover, the forms of organization available in German company law are outlined.

Content
The lecture begins with an introduction into the different terms of merchants of the German Commercial Code. Subsequently, the rules governing trade names, commercial registries and commercial agency are dealt with. This is followed by a presentation of the general rules of commercial transactions and of the specific commercial transactions. In company law, first of all, the basics of partnerships are explained. Thereafter, the focus will be on corporate law which is most important in practice.

Media
Slides.

Literature
Klunzinger, Eugen

- Grundzüge des Handelsrechts, Verlag Vahlen, 12. Aufl. 2003, ISBN 3-8006-2914-3
- Grundzüge des Gesellschaftsrechts, Verlag Vahlen, 13. Aufl. 2004, ISBN 3-8006-3077-X

Elective literature:
Will be announced in the lecture.

Course: Industrial Studies of Time and Motion [25967]

Coordinators: Simone Dürrschnabel
Part of the modules: Human Resource Management (p. 53)[IW3BWLIAP1]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER

Conditions
None.

Learning Outcomes

Content

Course: Industrial Organization [25371]

Coordinators: Siegfried Berninghaus
Part of the modules: Applied Game Theory (p. 54)[IW3VWL1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam (80 min) according to Section 4(2), 1 of the examination regulation.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
See corresponding module information.

Learning Outcomes
The students will learn to understand the negative effects of imperfect competition and possible political implications thereof. In every chapter of the course game theoretic models will be introduced with the objective to reveal how the theory of industrial organization can explain real world economic phenomena. The theoretical analysis of economic interrelations will be supplemented by class room experiments and if possible by presentations from business experts.

Content
In the first part of the course different market structures like monopoly, oligopoly and perfect competition will be introduced and compared with each other. In the main part advanced concepts on topics like price discrimination, product differentiation, collusive behavior, as well as different theoretical models on market entry and R&D will be presented.

Media
Slides.

Literature
• H. Bester (2007), Theorie der Industrieökonomik.
Berlin: Springer-Verlag
Elective literature:

- J. Tirole (1988), The Theory of Industrial Organization. Cambridge, MA: MIT-Press

- D. Carlton, J. Perloff (2005), Modern Industrial Organization. Reading, Mass.: Addison-Wesley

- N. Schulz (2003), Wettbewerbspolitik: eine Einführung aus industrieökonomischer Perspektive, Tübingen: Mohr Siebeck

Course: Informatics Seminar [SemInfo]

Coordinators: Martina Zitterbart
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The student

- deals with a well-defined problem in the Informatics domain in detail,

- analyses and discusses the given problems as part of the courses and in the final seminar papers,

- discusses, presents, and defends technical arguments within the given task specifications,

- organises the drafting of the final seminar paper mostly independently.

The competences gained as part of this seminar module serve as a preparation for the Bachelor thesis. Guided by the respective examiner, the student exercises independent scientific work in drafting and presenting the final seminar paper.

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

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

Course: Insurance Game [26372]

Coordinators: Christian Hipp, N.N.
Part of the modules: Insurance: Calculation and Control (p. 47)[IW3BWLFBV2]

ECTS Credits	Hours per week	Term	Instruction language
4	2	Summer term	de

Learning Control / Examinations
See module description.

Conditions
None.

Learning Outcomes

Content

Literature

- Insgame: Das Unternehmensplanspiel Versicherungen, Lehrstuhl für Versicherungswirtschaft, FBV, Uni Karlsruhe

- Zweifel, Eisen: Versicherungsökonomie, 2000, Kapitel 1, 2 und 5

- Aktuelle Ausgaben der Zeitschrift „Versicherunsgwirtschaft"

Course: Insurance Marketing [26323]

Coordinators: Ute Werner
Part of the modules: Insurance Markets and Management (p. 49)[IW3BWLFBV4]

ECTS Credits	Hours per week	Term	Instruction language
4.5	3/0	Winter / Summer Term	de

Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions
None.

Learning Outcomes
See German version.

Content
See German version.

Literature
Elective literature:

- Farny, D.. Versicherungsbetriebslehre (Kapitel III.3 sowie V.4). Karlsruhe 2006

- Kurtenbach / Kühlmann / Käßer-Pawelka. Versicherungsmarketing. . . . Frankfurt 2001

- Wiedemann, K.-P./Klee, A. Ertragsorientiertes Zielkundenmanagement für Finanzdienstleister, Wiesbaden 2003

Remarks
This course is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.
This course is offered on demand. For further information, see: http://insurance.fbv.uni-karlsruhe.de
To attend the course please register at the secretary of the chair of insurance science.

Course: Insurance Models [26300]

Coordinators: Christian Hipp, N.N.
Part of the modules: Insurance: Calculation and Control (p. 47)[IW3BWLFBV2]

ECTS Credits	Hours per week	Term	Instruction language
5	2/2	Summer term	de

Learning Control / Examinations
See module description.

Conditions
None.

Learning Outcomes

Content

Literature
Elective literature:

- Versicherungsbetriebslehre: Das Risiko und seine Kalkulation. Studienhefte 21, 22, 23. gabler Studientexte

- Gerber: An Introduction to mathematical Risk Theory. Huebner Foundation Monograph 8, Wharton School.

Course: Intelligent Systems in Finance [25762]

Coordinators: Detlef Seese
Part of the modules: eFinance (p. 38)[IW3BWLISM3]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	de

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

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, Portfolioselection 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 Fuzzylogic. Softwareagents 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 choosen from the area of finance.

Media
Slides.

Literature
There is no text book covering completely the content of the lecture.

- Z. Michalewicz, D. B. Fogel. How to Solve It: Modern Heuristics. Springer 2000.

- J. Hromkovic. Algorithms for Hard Problems. Springer-Verlag, Berlin 2001.

- P. Winker. Optimization Heuristics in Econometrics. John Wiley & Sons, Chichester 2001.

- A. Brabazon, M. O'Neill. Biologically Inspired Algorithms for Financial Modelling. Springer, 2006.

- A. Zell. Simulation Neuronaler Netze. Addison-Wesley 1994.

- R. Rojas. Theorie Neuronaler Netze. Springer 1993.

- N. Cristianini, J. Shawe-Taylor. An Introduction to Support Vector Machines and other kernal-based learning methods. Cambridge University Press 2003.

- G. Klir, B. Yuan. Fuzzy Sets and Fuzzy Logic: Theory and Applications. Prentice-Hall, 1995.

- F. Schlottmann, D. Seese. Modern Heuristics for Fiance Problems: A Survey of Selected Methods and Applications. In S. T. Rachev (Ed.) Handbook of Computational and Numerical Mrthods in Finance, Birkhäuser, Boston 2004, pp. 331 - 359.

Further references will be given in each lecture.

Elective literature:

- S. Goonatilake, Ph. Treleaven (Eds.). Intelligent Systems for Finance and Business. John Wiley & Sons, Chichester 1995.

- F. Schlottmann, D. Seese. Financial applications of multi-objective evolutionary algorithms, recent developments and future directions. Chapter 26 of C. A. Coello Coello, G. B.Lamont (Eds.) Applications of Multi-Objective Evolutionary Algorithms, World Scientific, New Jersey 2004, pp. 627 - 652.

- D. Seese, F. Schlottmann. Large grids and local information flow as reasons for high complexity. In: G. Frizelle, H. Richards (eds.), Tackling industrial complexity: the ideas that make a difference, Proceedings of the 2002 conference of the Manufacturing Complexity Network, University of Cambridge, Institute of Manufacturing, 2002, pp. 193-207. (ISBN 1-902546-24-5).

- R. Almeida Ribeiro, H.-J. Zimmermann, R. R. Yager, J. Kacprzyk (Eds.). Soft Computing in Financial Engineering. Physica-Verlag, 1999.

- S. Russel, P. Norvig. Künstliche Intelligenz Ein moderner Ansatz. 2. Auflage, Pearson Studium, München 2004.

- M. A. Arbib (Ed.). The Handbook of Brain Theory and neural Networks (second edition). The MIT Press 2004.

- J.E. Gentle, W. Härdle, Y. Mori (Eds.). Handbook of Computational Statistics. Springer 2004.

- F. Schweitzer. Brownian Agents and Active Particles. Collective Dynamics in the Natural and Social Sciences, Springer 2003.

- D. Seese, C. Weinhardt, F. Schlottmann (Eds.) Handbook on Information Technology in Finance, Springer 2008.

- 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: International Risk Transfer [26353]

Coordinators: Wolfgang Schwehr
Part of the modules: Insurance Markets and Management (p. 49)[IW3BWLFBV4]

ECTS Credits	Hours per week	Term	Instruction language
2.5	2/0	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam (according to Section 4 (2), 1 of the examination regulation) .
The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None.

Learning Outcomes
Becoming acquainted with the various possibilities of international risk transfer.

Content
How are the costs of potential major damages financed and covered on a global scale? Traditionally, direct insurers and, especially, reinsurers are conducting a global business, Lloyd's of London is a turntable for international risks, and global industrial enterprises are establishing captives for self insurance. In addition to this, capital markets and insurance markets are developing innovative approaches to cover risks, which were hard to insure in the past (e.g. weather risk). The lecture will elucidate the functioning and the background of these different possibilities of international risk transfer.

Literature

- K. Geratewohl. Rückversicherung: Grundlagen und Praxis Band 1-2.

- Brühwiler/ Stahlmann/ Gottschling. Innovative Risikofinanzierung - Neue Wege im Risk Management.

- Becker/ Bracht. Katastrophen- und Wetterderivate.

Remarks
Block course. To attend the course please register at the secretary of the chair of insurance science.

Course: International Finance [26570]

Coordinators: Marliese Uhrig-Homburg, Walter
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5], eFinance (p. 38)[IW3BWLISM3]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The objective of this course is to become familiar with the basics of investment decisions on international markets and to manage foreign exchange risks.

Content
The main aspects of this course are the chances and the risks which are associated with international transactions. We carry out our analysis from two distinct perspectives: First the point of view of an international investor second that, of an international corporation. Several alternatives to the management of foreign exchange risks are shown. Due to the importance of foreign exchange risks, the first part of the course deals with currency markets. Furthermore current exchange rate theories are discussed.

Literature
Elective literature:

- D. Eiteman et al. (2004): Multinational Business Finance, 10. Auflage

Course: Management Accounting [25210]

Coordinators: Torsten Lüdecke
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam (60 min) taking place in 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.

Conditions
None.

Learning Outcomes
This course aims at providing students with the understanding of the purposes of alternative costing systems as well as the use of relevant information for decision making. The course will also examine techniques for the purpose of cost management and accounting for control.

Content

- Design of Cost Systems
- Cost Classifications, Cost Behavior, and Principles of Cost Allocation
- Activity-based Costing
- Product Costing
- Production Decisions
- Cost-based Pricing
- Cost Management
- Decisions under Risk
- Cost Accounting for Control

Literature
Elective literature:

- Coenenberg, A.G. Kostenrechnung und Kostenanalyse, 6. Aufl. 2007.
- Ewert, R. und Wagenhofer, A. Interne Unternehmensrechnung, 7. Aufl. 2008.
- Götze, U. Kostenrechnung und Kostenmanagement. 3. Aufl. 2007.
- Kilger, W., Pampel, J., Vikas, K. Flexible Plankostenrechnung und Deckungsbeitragsrechnung , 11. Aufl. 2002.

Course: Investments [26575]

Coordinators: Marliese Uhrig-Homburg
Part of the modules: Essentials of Finance (p. 46)[IW3BWLFBV1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
The assessment consits of a written exam (75 min) according to Section 4(2), 1 of the examination regulation.
The examination takes place in every semester. Re-examinations are offered at eyery ordinary examination date.
By submitting the excercises (according to Section 4(2), 3 of the examination regulation) up to 4 bonus points can be aquired.

Conditions
None.

Recommendations
Knowledge of Business Administration and Management Science C [25026/25027] is recommended.

Learning Outcomes
The objective of this course is to become familiar with the basics of investment decisions on stock and bond markets. Basic economic concepts and models are discussed and applied on introductionary level. Interlinkages between markets, different decision makings 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. The lecture concludes with investments on bond markets.

Literature
Elective literature:
Bodie/Kane/Marcus (2010): Essentials of Investments, Eighth Edition, McGraw-Hill Irwin, Boston

Course: Theory of Business Cycles [25549]

Coordinators: Marten Hillebrand
Part of the modules: Macroeconomic Theory (p. 57)[IW3VWL8]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	en

Learning Control / Examinations
According to the attendance the assessment consists of a written or an oral exam at the beginning of the recess period (according to Section 4 (2), 1 or 2 of the examination regulation.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
Basic knowledge in micro- and macroeconomics, as conveyed in the courses *Economics I: Microeconomics* [25012] and *Economics II: Macroeconomics* [25014], is assumed.
According the focus of the course quantitativ-mathematical modelling should be in participiant's interest.

Learning Outcomes

Content

Literature
Elective literature:
David Romer, *Advanced Macroeconomics*, 3rd edition, MaGraw-Hill (2006)
Lutz Arnold: Makroökonomik. Eine Einführung in die Theorie der Güter-, Arbeits- und Finanzmärkte (2003)

Course: Mechanisms and Applications of Workflow Systems [24111]

Coordinators: Jutta Mülle, Silvia von Stackelberg
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
5	3	Winter term	de

Learning Control / Examinations
It will be announced in advance if the assessment consists of a written exam (approx. 60 minutes) according to section 4 subsection 2 no. 1 study and examination regulations or of an oral exam (approx. 20 minutes) following according to section 4 subsection 2 no. 2 study and examination regulations.

Conditions
This lecture cannot be taken if the lecture *Workflowmanagement-Systems* has been taken already.

Recommendations
Knowledge about database systems, e.g. from the lecture *Database Systems* [24516].

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.
Further, the course presents application-driven procedures for changing and adapting workflows to new reqirements, especially business process reengineering and continous process improvement.
The course concludes with recent research areas and results, e.g., methods and techniques to support flexible, adaptive workflows, security of workflows and process mining.

Media
Slides.

Literature

- Matthias Weske: Business Process Management. Springer, 2007

- Frank Leymann, Dieter Roller: Production Workflows - Concepts and Techniques. Prentice-Hall, 2000

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

- W.M.P. van der Aalst: Workflow Management: Models, Methods, and Systems. MIT Press, 368 pp., $40.00, ISBN 0-262-01189-1, 2002

- Michael Havey: Essential Business Process Modeling. O´Reilly Media, Inc., 2005

- S. Jablonski, M. Böhm, W. Schulze (Hrsg.): Workflow-Management - Entwicklung von Anwendungen und Systemen. dpunkt-Verlag, Heidelberg, 1997

Elective literature
Will be announced in the lecture.

Course: Logistics - Organisation, Design, and Control of Logistic Systems [2118078]

Coordinators: Kai Furmans
Part of the modules: Supply Chain Management (p. 37)[IW3BWLISM2]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Summer term	de

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 case studies.

Conditions
Requied are lectures on "Linear Algebra" and "Stochastic".

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 Managament

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

Identification Technologies

Media
Blackboard, LCD projector, in excercises also PCs.

Literature
Elective literature:

- Arnold/Isermann/Kuhn/Tempelmeier. Handbuch Logistik, Springer Verlag, 2002 (Neuauflage in Arbeit)
- Domschke. Logistik, Rundreisen und Touren, Oldenbourg Verlag, 1982
- Domschke/Drexl. Logistik, Standorte, Oldenbourg Verlag, 1996

- Gudehus. Logistik, Springer Verlag, 2007
- Neumann-Morlock. Operations-Research, Hanser-Verlag, 1993
- Tempelmeier. Bestandsmanagement in Supply Chains, Books on Demand 2006
- Schönsleben. Integrales Logistikmanagement, Springer, 1998

Remarks

Formerly, the course was known as *Logistics*.

Course: Logistics and Supply Chain Management [25996]

Coordinators: Frank Schultmann
Part of the modules: Industrial Production I (p. 44)[IW3BWLIIP1]

ECTS Credits	Hours per week	Term	Instruction language
3.5	2/0	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students shall learn foundations and main characteristics of managerial logistics and supply chain management. Following an overview of basic managerial logistics functions, students will learn the interdependencies and trade-offs between these functions and concurring aims. Additionally, students will gain knowledge in designing and steering internal and external value-creating networks.

Content
This course covers following topics:

- Introduction into logistics
- Fields of activity
- Aims and costs of logistics
- Performance and performance figures
- Supply logistics
- Production logistics
- Distributing logistics
- Reverse logistics
- Definition and aims of Supply Chain Management
- Concepts of Supply Chain Management
- Modeling Supply Chains

Media
Medie will be provided on learning platform.

Course: [24672]

Coordinators: Jörg Henkel
Part of the modules: (p. 83)[IW3INEBS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
Module "Entwurf und Architekturen für Eingebettete Systeme" [IN4INES2]
Basic knowledge fo the module "Optimierung und Synthese Eingebetteter Systeme" is helpful but not mandatory. The lecture is suited for both computer science and electrical engineering students.

Learning Outcomes

Content

Media
Slides

Course: Management of Business Networks [26452]

Coordinators: Christof Weinhardt, Jan Kraemer
Part of the modules: Supply Chain Management (p. 37)[IW3BWLISM2], eBusiness and Servicemanagement (p. 36)[IW3BWLISM1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	en

Learning Control / Examinations
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.

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).

Literature

- Milgrom, P., Roberts, J., Economics, Organisation and Management. Prentice-Hall, 1992.
- Shy, O., The Economics of Network Industries. Cambridge, Cambridge University Press, 2001.
- Bichler, M. The Future of e-Markets - Multi-Dimensional Market Mechanisms. Cambridge, Cambridge University Press, 2001.

Course: Management of Business Networks (Introduction) [26496]

Coordinators: Christof Weinhardt, Jan Kraemer
Part of the modules: Supply Chain Management (p. 37)[IW3BWLISM2]

ECTS Credits	Hours per week	Term	Instruction language
3		Winter term	en

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 according to section 4(2), 3 of the examination regulation. Grading: Exam counts for 85 % , excercises for 15 %.

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.

Literature

- Milgrom, P., Roberts, J., Economics, Organisation and Management. Prentice-Hall, 1992.

- Shy, O., The Economics of Network Industries. Cambridge, Cambridge University Press, 2001.

- Bichler, M. The Future of e-Markets - Multi-Dimensional Market Mechanisms. Cambridge, Cambridge University Press, 2001.

Remarks
This Version of the MBN Course does not include the case study in the second part of the lecture, so that it is worth less credits. The lecture was first offered in the winter term of 2009/10.

Course: Brand Management [25177]

Coordinators: Bruno Neibecker
Part of the modules: Foundations of Marketing (p.)[IW3BWLMAR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

Learning Control / Examinations

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

Literature

- Aaker, J. L.: Dimensions of Brand Personality. In: Journal of Marketing Research 34, 1997, 347-356.
- BBDO-Düsseldorf (Hrsg.): Brand Equity Excellence. 2002.
- BBDO-Düsseldorf (Hrsg.): Brand Equity Drivers Modell. 2004.
- Bruhn, M. und GEM: Was ist eine Marke? Gräfelfing: Albrecht (voraussichtlich 2003).
- Esch, F.-R.: Strategie und Technik der Markenführung. München: Vahlen 2003.
- Keller, K. L.: Kundenorientierte Messung des Markenwerts. In: Esch, F.-R. (Hrsg.): Moderne Markenführung. 3. Aufl. 2001.
- Kotler, P.; V. Wong; J. Saunders und G. Armstrong: Principles of Marketing (European Edition). Harlow: Pearson 2005.
- Krishnan, H. S.: Characteristics of memory associations: A consumer-based brand equity perspective. In: Internat. Journal of Research in Marketing 13, 1996, 389-405.
- Meffert, H.; C. Burmann und M. Koers (Hrsg.): Markenmanagement. Grundfragen der identitätsorientierten Markenführung. Wiesbaden: Gabler 2002.
- Neibecker, B.: Tachometer-ESWA: Ein werbewissenschaftliches Expertensystem in der Beratungspraxis. In: Computer Based Marketing, H. Hippner, M. Meyer und K. D. Wilde (Hrsg.), Vieweg: 1998, 149-157.
- Riesenbeck, H. und J. Perrey: Mega-Macht Marke. McKinsey&Company, Frankfurt/Wien: Redline 2004.
- Solomon, M., G. Bamossy, S. Askegaard und M. K. Hogg: Consumer Behavior, 3rd ed., Harlow: Pearson 2006.

Course: Marketing and Consumer Behavior [25150]

Coordinators: Wolfgang Gaul
Part of the modules: Foundations of Marketing (p.)[IW3BWLMAR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

Learning Control / Examinations

Conditions
See corresponding module description.
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.

Literature
Further literature references are announced in the script.

Course: Marketing and Operations Research [25156]

Coordinators: Wolfgang Gaul
Part of the modules: Foundations of Marketing (p.)[IW3BWLMAR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations

Conditions
Basics of Operations Research are required.

Learning Outcomes

Content

Literature
WIll be announced in the lecture. Further literature references are announced in the script.

Course: Mathematics I for Information Engineering and Management [01360]

Coordinators: Andreas Rieder, Christian Wieners, Nicolas Neuss
Part of the modules: Mathematics I (p. 28)[IW1MATH1]

ECTS Credits	Hours per week	Term	Instruction language
8	4/2/2	Winter term	de

Learning Control / Examinations
The assessment consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics I and

2. a written examination of 60 minutes on the lectures mathematics I following §4(2), 1 of the examination regulations.

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

Conditions
None.

Learning Outcomes
The aim of 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 requiered 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

Literature
Elective literature:

- Offer for interested and top students

    Ammann / Escher: Analysis I–III, Birkhäuer
- 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 [01877]

Coordinators: Andreas Rieder, Christian Wieners, Nicolas Neuss
Part of the modules: Mathematics II (p. 29)[IW1MATH2]

ECTS Credits	Hours per week	Term	Instruction language
8	4/2/2	Summer term	de

Learning Control / Examinations
The assessment in this module consists of

1. a graded certificate of exercise following §4(2), 3 of the examination regulation from the exercises to mathematics II and

2. a written examination of 60 minutes on the lectures mathematics II following §4(2), 1 of the examination regulations.

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

Conditions
Mathematics I
None.

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

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

Media
blackboard, data projector and transparencies if necessary

Literature
Elective literature:

- Offer for interested and top students

  Ammann / Escher: Analysis I–III, Birkhäuer

- Tutorials / simpler literature alternatives

  Henze / Last: Mathematik für Wirtschaftsingenieure I–II, Teubner

  Ansorge / Oberle: Mathematik für Ingenieure I–III, Wiley

Course: Mobile Communications [24643]

Coordinators: Oliver Waldhorst
Part of the modules: Telematics II (p. 72)[IW3INTM2]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowledge of the lectures *Introduction in Computer Networks* [24519] (or similar lectures) and *Telematics* [24128].

Learning Outcomes
The goal of the course is to introduce the technical foundations of mobile communication systems (signal propagation, medium access, etc.). An additional focus is on topics of current research (Mobile IP, Ad hoc Networks, Mobile TCP, etc.).

Content
The course "Mobile Communications" uses prominent examples for systems of currently deployed mobile communication systems, to explain typical architectures of such systems, e.g. mobile telecommunication systems, wireless personal, local, and metropolitan area networks. Additional topics related to current research efforts include TCP/IP-based communication over mobile networks and positioning systems. The goal of the course is not to teach facts on particular architectures and standards, but to show typical problems in mobile communications and present typical solutions. The fundamental principles of digital wireless transmissions including the frequency bands, signal propagation, modulation, and multiplexing are explained by application examples.

Media
Slides.

Literature
J. Schiller; Mobilkommunikation; Addison-Wesley, 2003.
Elective literature:
C. Eklund, R. Marks, K. Stanwood, S. Wang; IEEE Stadard 802.16: A Technical Overview of the WirelessMANTM Air Interface for the Broadband Wireless Access; IEEE Communications Magazine, June 2002.
H. Kaaranen, A. Ahtiainen, et. al., UMTS Networks – Architecture, Mobility and Services, Wiley Verlag, 2001.
B. O'Hara, A. Petrick, The IEEE 802.11 Handbook – A Designers Companion IEEE, 1999.
B. A. Miller, C. Bisdikian, Bluetooth Revealed, Prentice Hall, 2002
J. Rech, Wireless LAN – 802.11-WLAN-Technologien und praktische Umsetzung im Detail, Verlag Heinz Heise, 2004.
B. Walke, Mobilfunknetze und ihre Protokolle, 3. Auflage, Teubner Verlag, 2001.
R. Read, Nachrichten- und Informationstechnik; Pearson Studium 2004.
What You Should Know About the ZigBee Alliance http://www.zigbee.org.
C. Perkins, Ad-hoc Networking, Addison Wesley, 2000.
H. Holma, WCDMA For UMTS, HSPA Evolution and LTE, 2007

Course: Business Process Modelling [25736]

Coordinators: Andreas Oberweis, Marco Mevius
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8], Semantic Knowledge Management (p. 64)[IW3INAIFB2]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

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.

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 modells 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.

Literature
Literature will be given in the lecture.

Course: Modern Market Research [25154]

Coordinators: Wolfgang Gaul
Part of the modules: Foundations of Marketing (p. 42)[IW3BWLMAR]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
See module description.

Conditions
Basic knowledge of statistics.

Learning Outcomes

Content

Literature
Further literature references are announced in the script.

Course: Multimedia Communications [24132]

Coordinators: Roland Bless
Part of the modules: Telematics II (p. 72)[IW3INTM2]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowledge of the lectures *Introduction in Computer Networks* [24519] (or similar lectures) and *Telematics* [24128].

Learning Outcomes
Objective of the lecture is to present techniques, procotols, and latest developments in Internet-based multimedia communications. Especially in the context of increasing amount of voice communications over the Internet (Voice over IP), key technologies and protocols such as RTP and SIP are intensively discussed so that their function and principles are understood in detail.

Content
This lecture describes techniques and protocols to transmit audio and video data over the Internet. Topics are audio/video conferences, audio/video transport protocols, Voice over IP SIP for signaling, establishment and control of multimedia sessions, RTP for transport of multimedia data over the Internet, RTSP for control of A/V streams, ENUM, A/V Streaming, Middleboxes and Caches, DVB, and Video on Demand.

Media
Slides. Protocol traces.

Literature
James F. Kurose, and Keith W. Ross *Computer Networking* 4th edition, Addison-Wesley/Pearson, 2007, ISBN 0-321-49770-8, Chapter Multimedia Networking.
Elective literature:
Stephen Weinstein *The Multimedia Internet* Springer, 2005, ISBN 0-387-23681-3
Alan B. Johnston *SIP – understanding the Session Initiation Protocol* 2nd ed., Artech House, 2004
R. Steinmetz, K. Nahrstedt *Multimedia Systems* Springer 2004, ISBN 3-540-40867-3
Ulrick Trick, Frank Weber: *SIP, TPC/IP und Telekommunkationsnetze*, Oldenbourg, 3.
Auflage, 2007

Course: Nature-inspired Optimisation [25706]

Coordinators: Sanaz Mostaghim, Pradhyum Shukla
Part of the modules: Algorithms and Applications (p. 67)[IW3INAIFB5]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	en

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

Conditions
None.

Learning Outcomes
To learn:

1. Different nature-inspired methods: local search, simulated annealing, tabu search, evolutionary algorithms, ant colony optimization, particle swarm optimization

2. Different aspects and limitation of the methods

3. Applications of such methods

4. Mlti-objective optimization methods

5. Constraint handling methods

6. Different aspects in parallelization and computing platforms

Content
any optimization problems are too complex to be solved to optimality. A promising alternative is to use stochastic heuristics, based on some fundamental principles observed in nature. Examples include evolutionary algorithms, ant algorithms, or simulated annealing. These methods are widely applicable and have proven very powerful in practice. During the course, such optimization methods based on natural principles are presented, analyzed and compared. Since the algorithms are usually quite computational intensive, possibilities for parallelization are also investigated.

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

Literature
F. Glover and M. Laguna. „Tabu Search" In: Handbook of Applied Optimization, P. M. Pardalos and M. G. C. Resende (Eds.), Oxford University Press, pp. 194-208, 2002. G. Raidl and J. Gottlieb: Empirical Analysis of Locality, Heritability and Heuristic Bias in Evolutionary Algorithms: A Case Study for the Multidimensional Knapsack Problem. Evolutionary Computation, MIT Press, 13(4), pp. 441-475, 2005.
Weiterführende Literatur:
E. L. Aarts and J. K. Lenstra: „Local Search in Combinatorial Optimization". Wiley, 1997. D. Corne and M. Dorigo and F. Glover: „New Ideas in Optimization". McGraw-Hill, 1999. C. Reeves: „Modern Heuristic Techniques for Combinatorial Optimization". McGraw-Hill, 1995. Z. Michalewicz, D. B. Fogel: „How to solve it: Modern Heuristics". Springer, 1999. E. Bonabeau, M. Dorigo, G. Theraulaz: „Swarm Intelligence". Oxford University Press, 1999. A. E. Eiben and J. E. Smith: „Introduction to Evolutionary Computing". Springer, 2003. K. Weicker: „Evolutionäre Algorithmen". Teubner, 2002. M. Dorigo, T. Stützle: „Ant Colony Optimization". MIT Press, 2004. K. Deb: „Multi-objective Optimization using Evolutionary Algorithms", Wiley, 2003.

Course: Network Security: Architectures and Protocols [24601]

Coordinators: Marcus Schöller
Part of the modules: Telematics II (p. 72)[IW3INTM2]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowledge of the lectures *Introduction in Computer Networks* [24519] (or similar lectures) and *Telematics* [24128].

Learning Outcomes
The course aims at teaching fundamental concepts of the design of secure communication protocols. More advanced topics include existing security protocols of the internet and local networks.

Content
The lecture Network Security: Architectures and Protocols considers challenges and technologies in the design of secure communication protocols, as well as topics of data security and privacy. Complex systems like Kerberos will be discussed explicitly and their design decision considering security aspects will be outlined. A special focus is set on PKI-basics, infrastructures, as well as on specific PKI-formats. Furthermore, an emphasis is set on the commonly used security protocols IPSec, TLS/SSL, and protocols of infrastructure security.

Media
Slides.

Literature
Roland Bless et al. Sichere Netzwerkkommunikation. Springer-Verlag, Heidelberg, Juni 2005.
Elective literature:

- Charlie Kaufman, Radia Perlman, and Mike Speciner. Network Security: Private Communication in a Public World. 2nd Edition. Prentice Hall, New Jersey, 2002.

- Carlisle Adams and Steve Lloyd. Understanding PKI. Addison Wesley, 2003

- Rolf Oppliger. Secure Messaging with PGP and S/MIME. Artech House, Norwood, 2001.

- Sheila Frankel. Demystifiying the IPsec Puzzle. Artech House, Norwood, 2001.

- Thomas Hardjono and Lakshminath R. Dondeti. Security in Wireless LANs and MANs. Artech House, Norwood, 2005.

- Eric Rescorla. SSL and TLS: Designing and Building Secure Systems. Addison Wesley, Indianapolis, 2000.

Course: Network and IT-Security Management [24149]

Coordinators: Hannes Hartenstein
Part of the modules: Telematics II (p. 72)[IW3INTM2]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

Learning Control / Examinations

Conditions
Basics in computer networks, according to the lectures *Database Systems* [24516] and *Introduction in Computer Networks* [24519] and *Networked IT-Infrastructures* [24074] respectively are required.

Learning Outcomes
The goal of this lecture is to introduce the basics of network and IT-security management. At the end of the lecture, technical as well as underlying management concepts can be applied by the student .

Content
The lecture covers architectures, models, protocols and tools for controlling and monitoring of heterogeneous networks. Additionally, issues related to security and reliability of computer networks 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. Therefore, corresponding tools, platforms, and operational implementations are presented. Afterwards, public IP coordination, current trends, and the evolution of network management 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 for the operation of the Steinbuch Centre for Computing (SCC) are shown, for example the design of the fiber-based backbone KITnet or the wireless campus network. Furthermore, the supplemental tutorial extends the acquired theory in a practical way by using tools such as MIB browsers etc.

Media
Slides

Literature
Jochen Dinger, Hannes Hartenstein, Netzwerk- und IT-Sicherheitsmanagement : Eine Einführung, Universitätsverlag Karlsruhe, 2008.
Elective literature:
Heinz-Gerd Hegering, Sebastian Abeck, Bernhard Neumair, Integriertes Management vernetzter Systeme - Konzepte, Architekturen und deren betrieblicher Einsatz, dpunkt-Verlag, Heidelberg, 1999.
James F. Kurose, Keith W. Ross, Computer Networking. A Top-Down Approach Featuring the Internet, 3rd ed., Addison-Wesley Longman, Amsterdam, 2004.
Larry L. Peterson, Bruce S. Davie, Computer Networks - A Systems Approach, 3rd ed., Morgan Kaufmann Publishers, 2003.
William Stallings, SNMP, SNMPv2, SNMPv3 and RMON 1 and 2, 3rd ed., Addison-Wesley Professional, 1998.
Claudia Eckert, IT-Sicherheit. Konzepte - Verfahren - Protokolle, 4. Auflage, Oldenbourg, 2006.
Michael E. Whitman, Herbert J. Mattord, Management of Information Security, Course Technology, 2004.

Course: Nonlinear Optimization I [25111]

Coordinators: Oliver Stein
Part of the modules: Methodical Foundations of OR (p. 61)[IW3OR6], Stochastic Methods and Simulation (p. 62)[IW3OR7]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
The assessmentconsits of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation.
The exam takes place in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registration for the written examination is subject to fulfilling the prerequisite.
The examination can also be combined with the examination of *Nonlinear Optimization II* [25113]. In this case, the duration of the written examination takes 120 minutes.
In a combined examination of *Nonlinear Optimization I* [25111] and *Nonlinear Optimization II* [25113], upon attaining more then 60% of the exercise points, the grade of the passed examination is improved by a third of a grading step.
In a combined examination of *Nonlinear Optimization I* [25111] and *Nonlinear Optimization II* [25113], upon attaining more then 60% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Conditions
None.

Learning Outcomes
The student

- knows and understands fundamentals of nonlinear optimization,

- is able to choose, design and apply modern techniques of nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. The lecture is structured as follows:

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

Constrained problems are the contents of part II of the lecture.
The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002
- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993
- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004
- J. Nocedal, S. Wright, Numerical Optimization, Springer 2000

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

Course: Nonlinear Optimization II [25113]

Coordinators: Oliver Stein
Part of the modules: Methodical Foundations of OR (p. 61)[IW3OR6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam (120 minutes) according to §4(2), 1 of the examination regulation.
The exam takes place in the semester of the lecture and in the following semester.
Prerequisite for admission to the written examination is attaining at least 30% of the exercise points. Therefore the online-registrationfor the written examination is subject to fulfilling the prerequisite.
The exam can also be combined with the examination of *Nonlinear Optimization I* [25111]. In this case, the duration of the written exam takes 120 minutes.
In a combined exam of *Nonlinear Optimization I* [25111] and *Nonlinear Optimization II* [25113], upon attaining more then 60% of the exercise points, the grade of the passed exam is improved by a third of a grading step.
In a combined exam of *Nonlinear Optimization I* [25111] and *Nonlinear Optimization II* [25113], upon attaining more then 60% of the computer exercise points, the grade of the passed exam is improved by a third of a grading step.

Conditions
None.

Learning Outcomes
The student

- knows and understands fundamentals of nonlinear optimization,

- is able to choose, design and apply modern techniques of nonlinear optimization in practice.

Content
The lecture treats the minimization of smooth nonlinear functions under nonlinear constraints. For such problems, which occur very often in economics, engineering, and natural sciences, we derive optimality conditions that form the basis for numerical solution methods. Part I of the lecture treats unconstrained optimization problems. Part II of the lecture is structured as follows:

- Topology and first order approximations of the feasible set

- Theorems of the alternative, first and second order optimality conditions for constrained problems

- Optimality conditions for constrained convex problems

- Numerical methods for constrained problems (penalty method, multiplier method, barrier method, interior point method, SQP method, quadratic optimization)

The lecture is accompanied by computer exercises in which you can learn the programming language MATLAB and implement and test some of the methods for practically relevant examples.

Literature
Elective literature:

- W. Alt, Nichtlineare Optimierung, Vieweg, 2002

- M.S. Bazaraa, H.D. Sherali, C.M. Shetty, Nonlinear Programming, Wiley, 1993

- H.Th. Jongen, K. Meer, E. Triesch, Optimization Theory, Kluwer, 2004

- J. Nocedal, S. Wright, Numerical Optimization, Springer 2000

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

Course: Public Law I - Basic Principles [24016]

Coordinators: Indra Spiecker genannt Döhmann
Part of the modules: Constitutional and Administrative Law (p. 27)[IW1JURA3]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter term	de

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).

Conditions
None.

Learning Outcomes
The lecture covers the core principles of public law. Students shall become acquainted with the basics of constitutional law, the fundamental rights which route governmental actions and the entire legal system, as well as possibilities of actions and instruments (especially law, administrative act, public-private contract) of the public authority. Furthermore the distinction between public and private law will be clarified. Moreover, possibilities of legal protection regarding administrative behavior will be addressed. Students shall learn to classify problems in public law and to solve (simple) administrative and constitutional cases.

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 (simple) administrative and constitutional cases

Media
abstracts, sketches on blackboard, slides

Literature
tba in srciptum
Elective literature:
tba in scriptum

Remarks
From the winter term 2008 on, the *Public Law I* will be lectured during the winter termn 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 [24520]

Coordinators: Indra Spiecker genannt Döhmann
Part of the modules: Constitutional and Administrative Law (p. 27)[IW1JURA3]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Summer term	de

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.

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

Literature
Will be announced in the lecture.
Elective 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: Economics of Uncertainty [25365]

Coordinators: Karl-Martin Ehrhart
Part of the modules: Strategic Games (p. 55)[IW3VWL4]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2	Summer term	de

Learning Control / Examinations
Written exam, possible further requirements.

Conditions
See corresponding module information.
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.

Literature

- Hirshleifer und Riley (1997): The Analytics of Uncertainty and Information. London: Cambridge University Press, 4. Aufl.

- Berninghaus, S.K., K.-M. Ehrhart und W. Güth (2006): Strategische Spiele. Berlin u.a.: Springer, 2., überarbeitete und erweiterte Aufl. (oder erste Auflage, 2002)

Elective literature:

- Lippman/McCall, Economics of Uncertainty, in: Handbook of Mathematical Economics I, 1986

- DeGroot, Optimal Statistical Decisions, Kap. 1 und 2, 1970

Course: Operative CRM [26520]

Coordinators: Andreas Geyer-Schulz
Part of the modules: Specialization in Customer Relationship Management (p. 40)[IW3BWLISM5], CRM and Service Management (p. 39)[IW3BWLISM4]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Winter term	de

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:

Grade	Minimum points
1.0	104
1.3	98
1.7	92
2.0	86
2.3	80
2.7	74
3.0	68
3.3	62
3.7	56
4.0	50
4.7	40
5.0	0

Conditions

None.

Recommendations

The attendance of courses *Customer Relationship Management* [26508] and *Analyitical 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.

Literature

Jill Dyché. The CRM Handbook: A Business Guide to Customer Relationship Management. Addison-Wesley, Boston, 2 edition, 2002.
Ronald S. Swift. Accelerating Customer Relationships: Using CRM and RelationshipTechnologies. Prentice Hall, Upper Saddle River, 2001.

Elective literature:

Alex Berson, Kurt Thearling, and Stephen J. Smith. Building Data Mining Applications for CRM. Mc Graw-Hill, New York, 2000.
Stanley A. Brown. Customer Relationship Management: A Strategic Imperative in theWorld of E-Business. John Wiley, Toronto, 2000.
Dimitris N. Chorafas. Integrating ERP, CRM, Supply Chain Management, and SmartMaterials. Auerbach Publications, Boca Raton, Florida, 2001.

Keith Dawson. Call Center Handbook: The Complete Guide to Starting, Running, and Improving Your Call Center. CMP Books, Gilroy, CA, 4 edition, 2001.

Andreas Eggert and Georg Fassot. eCRM – Electronic Customer Relationship Management: Anbieter von CRM-Software im Vergleich. Schäffer-Poeschel, Stuttgart, 2001.

Seth Godin. Permission Marketing. Kunden wollen wählen können. FinanzBuch Verlag, München, 1999.

Paul Greenberg. CRM at the Speed of Light: Capturing and Keeping Customers in Internet Real Time. Osborne/McGraw-Hill, 3rd ed. edition, Aug 2004.

Philip Kotler. Marketing Management: Millennium Edition. Prentice Hall, Upper Saddle River, 10 edition, 2000.

Don Peppers and Martha Rogers. The One To One Future. Currency Doubleday, New York, 1997.

Duane E. Sharp. Customer Relationship Management Systems Handbook. Auerbach, 2002.

Len Silverston. The Data Model Resource Book: A Library of Universal Data Models for All Entreprises, volume 1. John Wiley & Sons, 2001.

Toby J. Teorey. Database Modeling and Design. Morgan Kaufmann, San Francisco, 3 edition, 1999.

Chris Todman. Designing a Data Warehouse : Supporting Customer Relationship Management.

Course: Organic Computing [25704]

Coordinators: Hartmut Schmeck, Sanaz Mostaghim
Part of the modules: Algorithms and Applications (p. 67)[IW3INAIFB5]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	en

Learning Control / Examinations
The assessment of this course consists of a written examination (60 min) (following §4(2), 1 SPO) and of submitting written papers or of writing an additional examination (called "bonus exam", 60 min) (following §4(2), 3 SPO). The exam will be offered every second semester (summer term) and may be repeated at every ordinary exam date.

Conditions
None.

Learning Outcomes
The student acquires the ability to master methods and concepts of Organic Computing and to demonstrate innovation skills regarding the used methods.
Therefore the course aims at the teaching of fundamentals and methods of Organic Computing within the context of its applicability in practice. On the basis of a fundamental understanding of the taught concepts and methods the students should be able to choose the adequate methods and concepts, if necessary further develop them according to the situation and use them properly when facing related problems in their later job. The students should be capable of finding arguments for the chosen solutions and express them to others.

Content
The mission of Organic Computing is to tame complexity in technical systems by providing appropriate degrees of freedom for self-organized behaviour adapting to changing requirements of the execution environment, in particular with respect to human needs. According to this vision an organic computer system should be aware of its own capabilities, the requirements of the environment, and it should be equipped with a number of "self-x" properties allowing for the anticipated adaptiveness and for a reduction in the complexity of system management. These self-x properties are self-organisation, self-configuration, self-optimization, self-healing, self-protection and self-explanation. In spite of these self-x properties, an organic system should be open to external control actions which might be necessary to prevent undesired behaviour.

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

Literature
- Autonomic Computing: Concepts, Infrastructure and Applications. M. Parashar and S. Hariri (Ed.), CRC Press. December 2006.
- Self-Organization in Biological Systems. S. Camazine, J. Deneubourg, N. R. Franks, J. Sneyd, G. Theraulaz and E. Bonabeau. Princeton University Press, 2003.
- Complex Adaptive Systems: An Introduction. H. G. Schuster, Scator Verlag, 2001.
- Introduction to Evolutionary Computing. A. E. Eiben and J. E. Smith. Natural Computing Series, Springer Verlag, 2003. Swarm Intelligence: From Natural to Artificial Systems.Eric Bonabeau, Marco Dorigo and Guy Theraulaz. Oxford University Press, 1999.
- Control of Complex Systems. K. Astrom, P. Albertos, M. Blanke, A. Isidori and W. Schaufelberger. Springer Verlag, 2001.

Elective literature:
- **Adaptive and Self-organising Systems,** Christian Müller-Schloer, Moez Mnif, Emre Cakar, Hartmut Schmeck, Urban Richter,
  June 2007. Preprint.Submitted to ACM Transactions on Autonomous and Adaptive Systems (TAAS)
- **Organic Computing - Addressing Complexity by Controlled Self-organization,** Jürgen Branke, Moez Mnif, Christian Müller-Schloer, Holger Prothmann, Urban Richter, Fabian Rochner, Hartmut Schmeck, In Tiziana Margaria, Anna Philippou, and Bernhard Steffen, *Proceedings of ISoLA 2006*, pp. 200-206. Paphos, Cyprus, November 2006.
- Evolutionary Optimization in Dynamic Environments. J. Branke. Kluwer Academic Publishers, 2002.
- Self-star Properties in Complex Information Systems: Conceptual and Practical Foundations (Lecture Notes in Computer Science. O. Babaoglu, M. Jelasity, A. Montresor, C. Fetzer, S. Leonardi, A. van Moorsel and M. van Steen. Springer Verlag, 2005.
- Design and Control of Self-organizing Systems. C. Gershenson. PhD thesis, Vrije Universiteit Brussel, Brussels, Belgium, 2007.
- VDE / ITG / GI - Positionspapier: Organic Computing - Computer- und Systemarchitektur im Jahr 2010. Juli 2003. it - Information Technology, Themenheft Organic Computing, Oldenbourg Verlag. Volume: 47, Issue: 4/2005.

further references will be announced in class

Course: Managing Organizations [25902]

Coordinators: Hagen Lindstädt
Part of the modules: Strategy and Organization (p. 43)[IW3BWLUO1]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Winter term	de

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

Conditions
None.

Learning Outcomes
The course should enable the participants to assess the strengths and weaknesses of existing organisational structures and rules using systematic criteria. Here concepts and models for designing organisation structures, regulating organisational processes and managing organisational changes are presented and discussed using case studies. The course is structured to relate to actions and aims to give students a realistic view of the opportunities and limits of rational design approaches.

Content

- Principles of organisational management
- Managing organisational structures and processes: the selection of design parameters
- Ideal-typical organisational structures: choice and effect of parameter combinations
- Managing organisational changes

Media
Slides.

Literature

- Laux, H.; Liermann, F.: *Grundlagen der Organisation*, Springer. 6. Aufl. Berlin 2005.
- Lindstädt, H.: *Organisation*, in Scholz, C. (Hrsg.): Vahlens Großes Personallexikon, Verlag Franz Vahlen. 1. Aufl. München, 2009.
- Schreyögg, G.: *Organisation. Grundlagen moderner Organisationsgestaltung*, Gabler. 4. Aufl. Wiesbaden 2003.

The relevant excerpts and additional sources are made known during the course.

Course: Parallel Algorithms [24109]

Coordinators: Peter Sanders
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowlege from lectures as *Algorithms I/II* are recommended.

Learning Outcomes
The Students are to learn basic techniques for the design of parallel algorithms as well as a selection of important parallel algorithms.

Content
Models and their relationship to real machines:

- Shared memory - PRAM

- Message passing, BSP

- Circuits

Analysis: speedup, efficiency, scalability
Basic techniques:

- SPMD

- Parallel divide and conquer

- Collective communication

- Load balancing

Examples of real algorithms:

- Collective Communication (also for large data sets): broadcast, reduce, prefix sums, all-to-all exchange

- Matrix arithmetic

- Sorting

- List ranking

- Minimum spanning trees

- Load balancing: master worker with adaptive problem size, random polling, random distribution

Media
Slides (pdf), scientific articles

Literature
Elective literature:

- Sanders, Worsch. Parallele Programmierung mit MPI – ein Praktikum

- Kumar, Grama, Gupta und Karypis. Introduction to Parallel Computing.

- JáJá. An Introduction to Parallel Algorithms

Remarks
This courese is offered irregularly.

Course: Human Resource Management and Labor Market Institutions [n.n.]

Coordinators: Christine Harbring
Part of the modules: Human Resource Management (p. 53)[IW3BWLIAP1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Summer term	de

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER

Conditions
None.

Learning Outcomes

Content

Course: [24127]

Coordinators: Frank Bellosa
Part of the modules: (p. 83)[IW3INEBS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes

Content

- CPU Power Management
- Memory Power Management
- I/O Power Management
- Battery Power Management
- Cluster Power Management
- Advanced Configuration and Power Interface (ACPI)

Media
lecture slides in English

Course: [24181]

Coordinators: Frank Bellosa, Merkel
Part of the modules: (p. 83)[IW3INEBS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
This course can only be taken in cooperation with course "Power Management" [24127].

Learning Outcomes

Content

Media
presentations, operating systems sources

Course: Computing Lab Information Systems [PraBI]

Coordinators: Andreas Oberweis, Detlef Seese, Rudi Studer
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
5	2	Winter / Summer Term	de

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.

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 topis which are discussed within corresponding lectures. Knowledge of these lecture topics is an advantage but not a precondition.

Media
Slides, Access to internet resources

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: Practical Course Internet Services [xIDLp]

Coordinators: Hartmut Schmeck, Stefan Tai, Wilfried Juling, Walter F. Tichy, Rudi Studer, Hannes Hartenstein
Part of the modules: Information Services in Networks (p. 66)[IW3INAIFB4]

ECTS Credits	Hours per week	Term	Instruction language
4	4	Winter / Summer Term	de

Learning Control / Examinations
The success control is realized by demanding practical work, presentations and a document describing the work according to $ 4(2),3 SPO Informationswirtschaft. The written document, the presentations and the practical work will be weighted in equal parts towards the total grade.

Conditions
the advanced lab may offered by any of the lecturers participatingin this module

Learning Outcomes
Students will

- carry out a literature study 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: [LPD]

Coordinators: Jörg Henkel
Part of the modules: (p. 83)[IW3INEBS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

Course: Practical Course in Algorithm Design [24079p]

Coordinators: Peter Sanders, Dorothea Wagner, Marcus Krug
Part of the modules: (p. 74)[IW3INALGOP]

ECTS Credits	Hours per week	Term	Instruction language
6	4	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Recommendations
Knowledge of the lecture Algorithms II is recommended.

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 exmaple, 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 miscallaneous 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: Applied Telematics [24443]

Coordinators: Martina Zitterbart
Part of the modules: Telematics (p. 71)[IW3INTM]

ECTS Credits	Hours per week	Term	Instruction language
2	1	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
The lecture *Applied Telematics* [24443] has to be attended in the same semester as the corresponding lecture *Telematics* [24128].

Learning Outcomes
This course details selected protocols, architectures, techniques, and algorithms, which were already presented in the course Telematics. It is intended to internalize the learned concepts by applying them in the exercise course or in the practical project, which takes place during the whole term.

Content
This course addresses protocols, architectures, techniques, and algorithms that are used, e.g., for Internet routing and establishing of reliable end-to-end communication associations. In addition to different media access control mechanisms in local area networks further communication systems, e.g. line-switched ISDN, are detailed. It is intended that students additionally understand which possibilities for network management and administration currently exist.

Media
Practice sheets

Literature
S. Keshav. *An Engineering Approach to Computer Networking*. Addison-Wesley, 1997
J.F. Kurose, K.W. Ross. *Computer Networking: A Top-Down Approach Featuring the Internet*. 4rd Edition, Addison-Wesley, 2007
W. Stallings. *Data and Computer Communications*. 8th Edition, Prentice Hall, 2006
Elective literature:

- D. Bertsekas, R. Gallager. *Data Networks*. 2nd Edition, Prentice-Hall, 1991
- F. Halsall. *Data Communications, Computer Networks and Open Systems*. 4th Edition, Addison-Wesley Publishing Company, 1996
- W. Haaß. *Handbuch der Kommunikationsnetze*. Springer, 1997
- A.S. Tanenbaum. *Computer-Networks*. 4th Edition, Prentice-Hall, 2004
- standards in the internet
- articles in journals

Course: Consulting in Practice [PUB]

Coordinators: Klemens Böhm, Dürr
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
1	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
At the end of the course, the participants

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

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

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

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

Emphasised topics in the course are:

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

Media
Slides, case studies.

Remarks
Seats are limited, so please register with Prof. Böhm's office.
This course is offered every three semesters, with the next time being in the winter term 2010/2011.

Course: Selling IT-Solutions Professionally [PLV]

Coordinators: Klemens Böhm, Hellriegel
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
1	2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
At the end of the course, the participants:

1. Have gained knowledge and understanding for the sales process.

2. Have obtained knowledge and understanding for typical roles and tasks.

3. Have gained an insight into practical and application-oriented aspects through an extensive case study and role plays.

Content
One of the key qualifications in IT sales (activities related to the customer) is the understanding of sales mechanisms as well as having the corresponding basic skills. This applies not only to the marketing staff, but also to consultants of customers, project managers and developers. After a short overview of the different types of businesses and the resulting requirements regarding marketing and sales in general, the course focuses in particular on the process of selling IT-solutions professionally.

The topics are structured as follows:

1. Understanding the market: which information regarding the markets of clients and suppliers needs to be obtained and where can such information be found.

2. Knowing the customer: what should a provider know about the customer and its staff? This goes up to the question with which characters one has to deal with.

3. Planning the sales process: sales builds on phases, milestones and formally describable intermediate results.

4. Building a sales team: solutions are developed and sold with a team consisting of "players" having different expertise. How does one play this game?

5. Positioning the solution: obviously, it is necessary to develop a solution which is competitive, both technically and commercially.

6. To contract: what is important at the very last steps: how to convince the customers.

Based on a real-world case study, the students have the opportunity to reflect and practice the learned theory by means of teamwork and role plays. This aims at establishing a first connection to reality. The topics of the course are enriched with many examples from practice.

Media
Presentation, case studies and group work material.

Literature
Elective literature:
Reiner Czichos: Creaktives Account-Management.

Remarks
Seats are limited, so please register with Prof. Böhm's office.
This course is offered every three semesters, with the next time being in the winter term 2010/2011.

Course: Principles of Insurance Management [25055]

Coordinators: Ute Werner
Part of the modules: Risk and Insurance Management (p. 48)[IW3BWLFBV3], Insurance Markets and Management
(p. 49)[IW3BWLFBV4]

ECTS Credits	Hours per week	Term	Instruction language
4.5	3/0	Summer term	de

Learning Control / Examinations
The assessment consists of oral presentations (incl. papers) within the lecture (according to Section 4 (2), 3 of the examination regulation) and a final oral exam (according to Section 4 (2), 2 of the examination regulation).
The overall grade consists of the assessment of the oral presentations incl. papers (50 percent) and the assessment of the oral exam (50 percent).

Conditions
None.

Learning Outcomes
See German version.

Content
See German version.

Literature

- D. Farny. *Versicherungsbetriebslehre.* 2006.

- P. Koch. *Versicherungswirtschaft - ein einführender Überblick.* 2005.

- M. Rosenbaum, F. Wagner. Versicherungsbetriebslehre. Grundlegende Qualifikationen. 2002.

- U. Werner. Einführung in die Versicherungsbetriebslehre. Skript zur Vorlesung.

Elective literature:
Will be announced in the lecture.

Remarks
To attend the course please register at the secretariat of the chair of insurance science.

Course: Private and Social Insurance [25050]

Coordinators: Wolf-Rüdiger Heilmann, Besserer
Part of the modules: Insurance Markets and Management (p. 49)[IW3BWLFBV4]

ECTS Credits	Hours per week	Term	Instruction language
2.5	2/0	Winter term	de

Learning Control / Examinations
The assessment consists of a written exam (according to Section 4 (2), 1 of the examination regulation) .
The exam takes place every semester. Re-examinations are offered at every ordinary examination date.

Conditions
None.

Learning Outcomes
Getting to know basic terms and functioning of private and social insurance.

Content
Basic terms of insurance, i.e. characteristics, judicial and political background and functioning of private and social insurance as well as their economic and societal and political meaning.

Literature
Elective literature:

- F. Büchner, G. Winter. Grundriss der Individualversicherung. 1995.

- P. Koch. Versicherungswirtschaft. 2005.

- Jahrbücher des GDV. Die deutsche Versicherungswirtschaft.

Remarks
Block course. To attend the course please register at the secretariat of the chair of insurance science.

Course: Exercises in Civil Law [24506/24017]

Coordinators: Peter Sester, Thomas Dreier
Part of the modules: Commercial Law (p. 26)[IW1JURA2]

ECTS Credits	Hours per week	Term	Instruction language
3	2/0	Winter / Summer Term	de

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.

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

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 knowlegde 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 sesssions the substantive law twhich 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 ae reserved to written exam problems which cover the totality of what students have learned so far. Aditional sessions are reserved for the subsequent in-class discussion of the exam problems.

Media
Slides

Literature
tba in the course.

Course: Programming [24004]

Coordinators: Alexander Pretschner
Part of the modules: Foundations in Informatics (p. 15)[IW1INF1]

ECTS Credits	Hours per week	Term	Instruction language
5	2/0/2	Winter term	de

Learning Control / Examinations
See German version.

Conditions
None.

Recommendations
Previous knowledge in java programming is recommended but not mandatory.

Learning Outcomes
Students should learn

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

Content

- objects and classes
- types, values and variables
- methods
- control structures
- recursion
- references, lists
- inheritance
- input and output
- exceptions
- programming methodology
- implementation of basic algorithms in Java (such as sorting algorithms)

Media
beamer, slides, blackboard, practice sheets

Literature
P. Pepper, Programmieren Lernen, Springer, 3. Auflage 2007
Elective literature:
B. Eckels: Thinking in Java. Prentice Hall 2006
J. Bloch: Effective Java, Addison-Wesley 2008

Course: Programming Paradigms [24030]

Coordinators: Gregor Snelting, Ralf Reussner
Part of the modules: Programming Paradigms (p. 80)[IW3IWPROGP]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
The requirements are explained in the module description.

Learning Outcomes

Content

Media
Slides, secondary literature.

Literature
Will be announced in the lecture.

Course: Project Management in Practice [PMP]

Coordinators: Klemens Böhm, Wolfgang Schnober
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
1	2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
At the end of the course, the participants:

- Know the principles of project management and are able to make use of them in real-world case studies.

- Have profound knowledge about project phases, principles of project planning, fundamental elements such as project charter & scope definitions, descriptions of project goals, activity planning, milestones, project-structure plans, agenda and cost planning and risk management. Further, they know principle elements of project implementation, crisis management, escalation and, last but not least, project-termination activities.

- Understand and are able to adopt the fundamentals of planning as well as the subjective factors which are relevant in a project. This includes topics such as communication, group processes, teambuilding, leadership, creative solution methods and risk-assessment methods.

The following key skills are taught:

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

Content
- General project conditions
- Project goals / creative methods for identifying project goals and priorities
- Project planning
- Activity planning
- Cost/time/resource planning
- Phase models
- Risk management
- Project control / success control / monitoring
- Crisis management
- Project termination / lessons learned

Media
Slides, SW-screenshots, misc. presentation techniques

Remarks
The materials are partly in English.
Seats are limited, so please register with Prof. Böhm's office.
This course is offered every three semesters, with the next time being in the winter term 2010/2011.

Course: Undergraduate Seminar Information Systems [prosemis]

Coordinators: Klemens Böhm
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations
The assessment consists of a written seminar thesis and a presentation thereof according to sec. 4 subsec. 2 no. 3 study and examination regulations. The final grade of the seminar will be the grade for the seminar thesis which can be increased or decreased by up to two grade points ("Notenstufen") according to the performance in the oral presentation.
For further details please see the German version.

Conditions
Lectures held at the Information Systems Group related to the current topic of the seminar are strongly recommended.

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.

Literature
Will be announced for every seminar.
Elective literature:
Literature from lectures concerning the seminar topic.

Course: Quantitative Methods for Supply Chain Risk Management [2118090]

Coordinators: Cardeneo
Part of the modules: Supply Chain Management (p. 37)[IW3BWLISM2]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Summer term	de

Learning Control / Examinations
The assessment consists of an oral exam according to §4 (2), 2 of the examination regulation. It may be a written exam (according to §4 (2), 1 of the examination regulation) in the case of large number of participants.

Conditions
Knowledge in Logistics and Operations Research are recommended (linear and mixed integer optimization, simple graph theory, and basic knowledge of statistics).

Learning Outcomes
The student

- identifies, analyzes and assigns risks of logistic systems

- plans location and transport decisions under uncertainty

- knows risk-relevant elements and knows adequate countermeasures for planning processes (regarding procurement, demand, infrastructure, continuity management)

Content
The planning and the operation of logistics systems are strongly connected with uncertainty: It is the unknown demand, varying transportation times, unexpected delays, irregularly production yield or volatile rates of exchange: Quantities, times, qualities and prices are uncertain values. Therefore it is necessary to deal with particular these uncertain values to avoid negative effects . In this lecture we mostly work with mathematical models and methods to control the various kinds of risks.

Literature
Will be announced in the lecture.

Course: Randomized Algorithms [24171]

Coordinators: Thomas Worsch
Part of the modules: Algorithm Design (p. 73)[IW3INALGT]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes
Students know the important approaches and techniques for the use of randomization in algorithms, as well as tools for their analysis.

Students are able to find weak points in deterministic algorithms, to develop randomized approaches to eliminate them, and to assess them using tools from probabilisty theory.

Content
Randomised algorithms are not deterministic. Their behavior depends on the outcome of random experiments. One of the first uses is Rabin's randomized test for primality. Meanwhile for a multitude of problems randomized algorithms have been described which are faster (at least in some sense) than deterministic algorithms. In addition sometimes randomized algorithms are easier to understand and/or implement then deterministic algorithms.

During the course not only different kinds of randomized algorithms (Las Vegas, Monte
Carlo, ...) are presented; the foundations from probability theory needed e.g. for the analysis of the time complexity are presented, too. Also, important concepts like Markov chains are treated. Since stochastic methods are gaining importance in more and more areas in computer science, the course will also be useful outside the area of randomized algorithms.

Topics: 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;

Literature

- J. Hromkovic : Randomisierte Algorithmen, Teubner, 2004
- M. Mitzenmacher, E. Upfal: Probability and Computing, Cambridge Univ. Press, 2005
- R. Motwani, P. Raghavan: Randomized Algorithms, Cambridge Univ. Press, 1995

Elective literature:

- E. Behrends: Introduction to Markov Chains, Vieweg, 2000
- A. Borodin, R. El-Yaniv: Online Computation and Competitive Analysis, Cambridge Univ. Press, 1998

Course: Real Estate Management I [26400w]

Coordinators: Thomas Lützkendorf
Part of the modules: Real Estate Management (p. 52)[IW3BWLOOW2]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/2	Winter term	de

Learning Control / Examinations
The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (REM I and REM II) happen in the same semester in which the lectures take place. Therefore, REM I exams currently only take place in the winter semester and REM II exams take place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Conditions
A combination with the module *Design Construction and Assessment of Green Buildings I* [IW3BWLOOW1] is recommended. Furthermore it is recommeded to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Learning Outcomes
Application of economic methods to the fields of real estate economics and sustainable construction.

Content
The course Real Estate Management I deals with questions concerning the economy of a single building througout its lifecycle. Among other topics this includes project development, location and market studies, german federal building codes as well as finance and assessment of economic efficiency.
The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

Media
Presentation slides and supplementary material is provided partly as printout, partly online for download.

Literature
Elective literature:

- Gondring (Hrsg.): „Immobilienwirtschaft: Handbuch für Studium und Praxis". ISBN 3-8006-2989-5. Vahlen 2004
- Kühne-Büning (Hrsg.): „Grundlagen der Wohnungs- und Immobilienwirtschaft". ISBN 3-8314-0706-1. Knapp & Hammonia-Verlag 2005
- Schulte (Hrsg.): „Immobilienökonomie Bd. I". ISBN 3-486-25430-8. Oldenbourg 2000

Remarks
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

Course: Real Estate Management II [26400]

Coordinators: Thomas Lützkendorf
Part of the modules: Real Estate Management (p. 52)[IW3BWLOOW2]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/2	Summer term	de

Learning Control / Examinations
The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (REM I and REM II) happen in the same semester in which the lectures take place. Therefore, REM I exams currently only take place in the winter semester and REM II exams take place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

Conditions
A combination with the module *Design Construction and Assessment of Green Buildings I* [IW3BWLOOW1] is recommended. Furthermore it is recommeded to choose courses of the following fields

- Finance and Banking

- Insurance

- Civil Engineering and Architecture (building physics, structural design, facility management)

Learning Outcomes
Application of economic methods to the fields of real estate economics and sustainable construction.

Content
The course Real Estate Management II gives special attention to topics in connection to the management of large real estate portfolios. This especially includes property valuation, market and object rating, maintenance and modernization, as well as real estate portfolio and risk management. The tutorial provides examples in order to practice the application of theoretical knowledge to practical problems.

Media
Presentation slides and supplementary material is provided partly as printout, partly online for download.

Literature
Elective literature:
See german version.

Remarks
The course is replenished by excursions and guest lectures by practicioners out of the real estate business.

Course: Computer Organization [24502]

Coordinators: Tamim Asfour, Rüdiger Dillmann, Jörg Henkel, Wolfgang Karl
Part of the modules: Computer Engineering (p. 18)[IW2INF4]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1/2	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes
The students are to be enabled to

- gain fundamental knowledge of computer organization, i.e. the architecture and the operation principle of computer systems,
- understand the relationship between hardware concepts and their effects on the software, in order to build efficient programs,
- comprehend the fundamental principles of the design process and being able to apply them, based on the understanding of the interdependencies of technology, computer concepts and applications,
- build up a computer from basic components.

Content
This course deals with the fundamentals of computer organisation; the instruction set architecture in conjunction with the discussion RISC – CISC; pipelining, pipeline constraints and methods for the resolution of pipeline conflicts; memory organization, cache memory; I/O system and interface modules; interrupt handling; bus systems; support of operating system functions: virtual memory management and protection mechanisms.

Media
slides, practice sheets

Literature
Elective literature:

- D. Patterson, J. Hennessy: Rechnerorganisation und -entwurf; Deutsche Auflage. Herausgegeben von Arndt Bode, Wolfgang Karl und Theo Ungerer, Spektrum Verlag, 2006
- Th. Flick, H. Liebig: Mikroprozessortechnik; Springer-Lehrbuch, 5. Auflage 1998
- Y.N. Patt & S.J. Patel: Introduction to Computing Systems: From bits & gates to C & beyond; McGrawHill, August 2003

Course: [24570]

Coordinators: Jörg Henkel, Wolfgang Karl
Part of the modules: (p. 82)[IW3INRS]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Summer term	de

Learning Control / Examinations

Conditions
Knowledge of the module *Technische Informatik* [IN1INTI] is required.

Learning Outcomes

Content

Media
slides, work sheets

Literature
Elective literature:

- Hennessy, J.L., Patterson, D.A.: Computer Architecture: A Quantitative Approach. Morgan Kaufmann, 3.Auflage 2002
- U. Bringschulte, T. Ungerer: Microcontroller und Microprozessoren, Springer, Heidelberg, 2. Auflage 2007
- Theo Ungerer: Parallelrechner und parallele Programmierung, Spektrum-Verlag 1997

Course: Financial Accounting and Cost Accounting [25002/25003]

Coordinators: Thomas Burdelski
Part of the modules: Foundations in Business Administration (p. 20)[IW1BWL1]

ECTS Credits	Hours per week	Term	Instruction language
4	2/2	Winter term	de

Learning Control / Examinations
The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.
The examination takes place in every semester. Re-examinations are offered at every ordinary examination date.

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

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: Capability maturity models for software and systems engineering [25790]

Coordinators: Ralf Kneuper
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
4	2	Summer term	de

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

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 toCMMI

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.

Literature
Literature is given in each lecture individually.

Course: Semantic Web Technologies I [25748]

Coordinators: Rudi Studer, Sebastian Rudolph, Andreas Harth
Part of the modules: Semantic Knowledge Management (p. 64)[IW3INAIFB2], Information Services in Networks (p. 66)[IW3INAIFB4], Semantic Web and Applications (p. 65)[IW3INAIFB3]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

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.

Conditions
Lectures on Informatics of the Bachelor on Information Management (Semester 1-4) or equivalent.

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.

Literature

- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, York Sure: Semantic Web - Grundlagen, Springer, 2008 (ISBN 978-3-540-33993-9)
- S. Staab, R. Studer (Editors). Handbook on Ontologies. International Handbooks in Information Systems. Springer 2003.

Elective literature:

1. Pascal Hitzler, Markus Krötzsch, Sebastian Rudolph, Foundations of Semantic Web Technologies. Textbooks in Computing, Chapman and Hall/CRC Press, 2009.
2. G. Antoniou, Grigoris Antoniou, Frank Van Harmelen, A Semantic Web Primer, MIT Press, 2004
3. Uwe Schöning. Logik für Informatiker. Spektrum Akademischer Verlag, 5. Auflage 2000
4. Steffen Hölldobler. Logik und Logikprogrammierung. Synchron Verlag, 3. Auflage 2003
5. Dieter Fensel. Spinning the Semantic Web. 2003 (ISBN 0262062321).
6. Handschuh, Staab. Annotation for the Semantic Web. 2003 (ISBN 158603345X).
7. J. Sowa. Knowledge Representation. Brooks/Cole 1999
8. Tim Berners-Lee. Weaving the Web. Harper 1999 geb. 2000 Taschenbuch.
9. Ian Jacobs, Norman Walsh. Architecture of the World Wide Web, Volume One. W3C Recommendation 15 December 2004. http://www.w3.org/TR/webarch/

Course: Seminar in Algorithm Design [24079s]

Coordinators: Dorothea Wagner
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is explained in the module description.

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 similiar to those enforced in standard scientific publication processes.
- devise a presentation in the context of the scientifc 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: Seminar in Applied Informatics [25070s]

Coordinators: Andreas Oberweis, Hartmut Schmeck, Detlef Seese, Rudi Studer, Stefan Tai
Part of the modules: Semantic Web and Applications (p. 65)[IW3INAIFB3]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	

Learning Control / Examinations
The assessment is done according to §4(2), 3 of the examination regulation in form of an evaluation of the seminar presentation and a written seminar report. The weighting of the individual marks (presentation and report) is announced at the beginning of the seminar.

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 as generally found in scientific publications.

Content
The 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 an advantage but not a precondition.

Media
Slides, Access to internet resources

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 Cryptography [SemiKryp3]

Coordinators: Jörn Müller-Quade
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The student

- deals with a restricted problem in the field of cryptography,

- analyzes and discusses the problems associated to a distinct discipline in the final seminar paper,

- discusses, presents and defends subject-specific arguments within a given task,

- organizes the preparation of the final papers largely independent.

Content
The seminar deals with current topics in the research field of cryptography. These are e.g.

- provable security

- side channel attacks;

- new Public-Key systems;

- quantum cryptography

Course: Seminar in Telematics [24074s]

Coordinators: Martina Zitterbart, Hannes Hartenstein
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
4	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students learn how

- to do a literature study starting from a given subject to identify relevant literature and to review and to evaluate it.
- to identify independently issues that arise from sub-domains of Telematics and to classify approaches to a solution found in the literature.
- to prepare scientific presentations. Techniques are introduced that help to present a subject before an audience in a proper way. Part of this is also to present the topic in a given time frame and to answer questions that may arise from the topic.
- to identify open questions of other presentations and to contribute them to a discussion that follows each presentation.
- to present the results of the literature study in a written document in a way that is common practice for scientific publications.

Content
In this seminar, the focus is on specific subjects that were introduced in the respective lectures, and on an in-depth discussion of those topics. Hereby, topics from different domains such as Future Internet research, sensor networks, network security, or highly distributed IT systems in the Internet are covered.

Course: Seminar in Law [rechtsem]

Coordinators: Thomas Dreier, Peter Sester, Indra Spiecker genannt Döhmann
Part of the modules: Seminar Module Law (p. 33)[IW3SEMJURA]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
Written paper and oral presentation (§4, Abs. 2, 3 of the SPO).

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).

Literature
Tba in the lecture.

Course: Seminar in Security [SemSich]

Coordinators: Jörn Müller-Quade, Martina Zitterbart
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The student

- deals with a restricted problem in the field of computer security,

- analyzes and discusses the problems associated to a distinct discipline in the final seminar paper,

- discusses, presents and defends subject-specific arguments within a given task,

- organizes the preparation of the final papers largely independent.

Content
The seminar deals with current topics in the research field of computer security. These are e.g.

- Side channel attacks;

- Network security;

- Communication protocols;

Course: Seminar in Enterprise Information Systems [SemAIFB1]

Coordinators: Rudi Studer, Andreas Oberweis, Thomas Wolf, Ralf Kneuper
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment of this course is according to §4(2), 3 SPO 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.
The seminar is for bachelor as well as master students. The differentiation will be made by selection of different topics and different standards of evaluation.

Conditions
See corresponding module information.

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 topis 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

Literature
Literature will be given individually in the specific seminar.

Course: Seminar Energy Economics [SemEW]

Coordinators: Wolf Fichtner, Dominik Möst, Patrick Jochem
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

Course: Seminar in Finance [25293]

Coordinators: Marliese Uhrig-Homburg, Martin E. Ruckes
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
Knowledge of the content of the modules *Essentials of Finance* [IW3BWLFBV1] or *F1 (Finance)* [WW4BWLFBV1] is assumed.

Learning Outcomes
The student gets in touch with scientific work. Through profound working on a specific scientific topic the student is meant to learn the foundations of scientific research and reasoning in particular in finance.
Through the presentations in this seminar the student becomes familiar with the fundamental techniques for presentations and foundations of scientific reasoning. In addition, the student earns rhetorical skills.

Content
Within this seminar different topics of current concern are treated. These topics have their foundations in the contents of certain lectures.
The topics of the seminar are published on the website of the involved finance chairs at the end of the foregoing semester.

Literature
Will be announced at the end of the foregoing semester.

Course: Seminar in Industrial Production [SemIIP2]

Coordinators: Frank Schultmann, Magnus Fröhling, Michael Hiete
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
Assessment acc. to §4 (2), No.3 ER by assessing the written seminar thesis (approx. 20 pages), the oral presentation and active participation in public discussions. The final grade will be formed by weighing the individual assessment grades.

Conditions
Students should have completed the modules „Industrial Production I" [IW3BWLIIP1], „Industrial Production II" [WW4BWLIIP2] or "Industrial Production III" [WW3BWLIIP6].

Learning Outcomes
Students shall gain insights into selected research projects of the Institute of Industrial Production (IIP).

- Students search for, identify, review and evaluate relevant literature.
- Students prepare their seminar thesis (and later on bachelor/master thesis) with a minimum expense in becoming acquainted with their topic and general layout.
- Students produce an oral presentation in a scientific context by using the outlined techniques of scientific presentation.
- Students learn to present their written results in an adequate form for scientific publishing.

Students in M.Sc. studies will have to put special emphasis on a critical discussion and evaluation of their topic, since they will have to look into actual scientific results in the field of industrial production.

Content
This seminar covers actual topics of industrial production, logistics, environmental science, project management and similar fields. We recommend a successful attendance of previous IIP modules (not compulsory!).
Actual topics covered in this seminar will be published before the start of semester.

Course: Seminar Information Engineering and Management [SemIW]

Coordinators: Christof Weinhardt
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
See corresponding module information.
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 a interdisciplinary examination.

Media

- Powerpoint,
- eLearning Platform Ilias
- Software Tools, if necessary

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.

Course: Seminar Internet Services [xIDLs]

Coordinators: Hartmut Schmeck, Stefan Tai, Wilfried Juling, Rudi Studer, Hannes Hartenstein, Walter F. Tichy
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The success monitoring is based on a presentation about a research topic from the current topic of the seminar followed by a discussion, and a written summary as well as active participation in discussions (in accordance with §4(2),3 of SPO Informationswirtschaft).

Conditions
A seminar can be chosen with one of the Professors participating in this module.

Learning Outcomes
Students will

- conduct a literature search based on a given topic and identify, find, evaluate and analyze the relevant literature
- Prepare their seminar paper (and later their Bachelor/Master thesis) with minimal familiarization effort while obeying format requirements like the ones provided by publishers when publishing documents
- Prepare presentations in a scientific context. Therefore techniques are introduced facilitating the preparation of content in a manner that is appropriate for the audience
- Present the results of their 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 students' knowledge. Previously attending the lecture is recommended but not a prerequisite.

Course: Seminar Software Systems [SWSSem]

Coordinators: Ralf Reussner
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The students can

- conduct literature search for a given topic and can identify, locate, assess and evaluate the relevant literature.

- present the research results in a written form similar to scientific publications.

- write their papers with minimal effort, taking formatting and length requirements, as they are set by all publishers of scientific publications, into consideration.

- learn to cite related work in a scientific way and learn to create auditorium-appropriate presentations in the context of a scientific topic.

- achieve knowledge about techniques and tools for systematic software engineering, such as software design, software architectures, predictions of functional and extra-functional properties of software, documentation, testing, etc.

Content
This course treats cutting-edge research topics from the area of software systems, i.e. software engineering and performance engineering.

Course: Seminar Software Engineering [SWTSem]

Coordinators: Walter F. Tichy, Ralf Reussner, Gregor Snelting
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
Basic knowledge of software engineering from lectures or practical experience is required.
Ability to create programs with low complexity and knowledge of an object-oriented programming language (e.g. Java, C#, or C++) are required.
Knowledge of the English terminology is required.

Learning Outcomes
The students will

- independently research literature for a given topic. This includes searching and identifying relevant literature as well as evaluating and interpreting its content.
- learn to optimize the time needed to cope with the relevant parts of the concrete topic.
- write a term paper that complies with formatting rules (as they will be enforced by all publishers for common publications).
- prepare a presentation for a scientific topic. We will discuss techniques that help to prepare and present the contents with respect to the targeted audience.

write down the results of their research similar to the form of a scientific publication.

Content
The seminar covers topics of recent research in the field of software engineering.

Course: Seminar Stochastic Models [SemWIOR1]

Coordinators: Karl-Heinz Waldmann
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	

Learning Control / Examinations
The assessment of this course is in form of an examination of the written seminar thesis and a presentation. The final mark is the result of both the paper and its presentation.

Conditions
None.

Learning Outcomes
In case studies students comprehend stochastic relationships and gain deep knowledge of modelling, evaluation, and optimization of stochastic systems. In group presentations, students learn basic academic presentation and argument skills.

Content
The actual topic as well as the contemporary issues are available online.

Media
Power Point and related presentation techniques.

Literature
Will be presented with the actual topic.

Course: Seminar Knowledge Management [SemAIFB4]

Coordinators: Rudi Studer
Part of the modules: Seminar Module Informatics (p. 31)[IW3SEMINFO]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The success monitoring is done through a presentation about a research topic from the current topic of the seminar (45-60 minutes) followed by a discussion, a written summary of the main points (approx. 15 pages) and of active participation in discussions (in accordance with §4(2),3 SPO).
The total mark is composed of the graded and weighted success controls (50% lecture, 30% written paper, and 20% participation and discussion.
The seminar can be attended by both bachelor and master students. A differentiation is made by different topic assignment and evaluation standards for seminar paper and presentation.

Conditions
See module description.

Learning Outcomes
The students will learn to perform literature searches on current topics in computer science and holistic knowledge management 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 Scoial Computing,
- Business-process Oriented Knowledge Management.

Media
Slides.

Literature

- I. Nonaka, H. Takeuchi: The Knowledge Creating Company. Oxford University Press 1995
- G. Probst et al.: Wissen managen - Wie Unternehmen ihre wertvollste Ressource optimal nutzen. Gabler Verlag, Frankfurt am Main/ Wiesbaden, 1999
- Pascal Hitzler, Markus Krötzsch, Sebastian Rudolf, York Sure: Semantic Web - Grundlagen, Springer, 2008 (ISBN 978-3-540-33993-9)
- S. Staab, R. Studer: Handbook on Ontologies, ISBN 3-540-40834-7, Springer Verlag, 2004
- Modern Information Retrieval, Ricardo Baeza-Yates & Berthier Ribeiro-Neto. New York, NY: ACM Press; 1999; 513 pp. (ISBN: 0-201-39829-X.)

Remarks
The number of students is limited. Students have to observe the designated registration process.

Course: Seminar in Insurance Management [SemFBV1]

Coordinators: Ute Werner
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
See corresponding module information.
The seminar is held within the courses of *Insurance Management* [IW3BWLFBV4] and [WW4BWLFBV6/7], respectively.
A course taken as a seminar cannot be chosen as a part of a course module (and vice versa).

Recommendations
The seminar fits well with the bachelor modules *Risk and Insurance Management* [IW3BWLFBV3] and *Insurance Markets and Management* [IW3BWLFBV4] as well as with the master modules *Insurance Management I* [WW4BWLFBV6] and *Insurance Management* II [WW4BWLFBV7]. These modules, though, are not required to be taken.

Learning Outcomes
See German version.

Content
The seminar is offered within the following courses:

- Principles of Insurance Management
- Insurance Marketing
- Insurance Production
- Service Management

For their contents refer to the information given at the referring pages.

Literature
Will be announced at the beginning of the lecture period.

Remarks
Some of the respective courses are offered on demand. For further information, see: http://insurance.fbv.uni-karlsruhe.de
To attend the course please register at the secretary of the chair of insurance science.

Course: Seminar in Operational Risk Management [SemFBV2]

Coordinators: Ute Werner
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
See corresponding module information.
The seminar is held within the courses of *Operational Risk Management I/II* [WW4BWLFBV8/9] but with special forms of working.
A course taken as a seminar cannot be chosen as a part of a course module (and vice versa).

Recommendations
The seminar fits well with the bachelor module *Risk and Insurance Management* [IW3BWLFBV3] as well as with the master modules *Operational Risk Management I* [WW4BWLFBV8] and *Operational Risk Management* II [WW4BWLFBV9]. These modules, though, are not required to be taken.

Learning Outcomes
See German version.

Content
The seminar is offered within the following courses:

- Enterprise Risk Management
- Multidisciplinary Risk Research
- Risk Communication
- Risk Management of Microfinance and Private Households
- Project Work in Risk Research

For their contents refer to the information given at the referring pages.

Literature
Will be announced at the beginning of the course period.

Remarks
Some of the respective courses are offered on demand. For further information, see: http://insurance.fbv.uni-karlsruhe.de
To attend the course please register at the secretary of the chair of insurance science.

Course: Seminar in Discrete Optimization [25491]

Coordinators: Stefan Nickel
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment consists of a written seminar thesis of 20-25 pages and a presentation of 40-60 minutes (according to §4(2), 3 of the examination regulation).
The final mark for the seminar is the weighted average of the marks for the assessed assignments (seminar thesis 50 %, presentation 50%).
The seminar can be attended both by Bachelor and Master students. A differentiation will be achieved by different valuation standards for the seminar thesis and presentation.

Conditions
Successful completion of the module *Introduction to Operations Research* [IW1OR].

Learning Outcomes
The seminar aims at the presentation, critical evaluation and exemplary discussion of recent questions in discrete optimization. The focus lies on optimization models and algorithms, also with regard to their applicability in practical cases (especially in Supply Chain and Health Care Management).
The students get in touch with scientific working: The in-depth work with a special scientific topic makes the students familiar with scientific literature research and argumentation methods. As a further aspect of scientific work, especially for Master students the emphasis is put on a critical discussion of the seminar topic.
Regarding the seminar presentations, the students will be familiarized with basic presentational and rhetoric skills.

Content
The topic of the seminar will be announced at the end of the preceding term on the internet.

Literature
Literature and relevant sources will be announced at the beginning of the seminar.

Remarks
The seminar is offered in each term.

Course: Seminar in Experimental Economics [SemWIOR3]

Coordinators: Siegfried Berninghaus
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / **Examinations**
Term paper and presentation

Conditions
See corresponding module information.
A course in the field of Game Theory should be attended beforehand.

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.

Literature
Will be announced at the end of the recess period.

Course: Seminar in Continous Optimization [25131]

Coordinators: Oliver Stein
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
The assessment is composed of a 15-20 page paper as well as a 40-60 minute oral presentation according to §4(2), 3 of the examination regulation.
The total grade is composed of the equally weighted grades of the written and oral assessments.
The seminar is appropriate for bachelor as well as for master students. Their differentiation results from different assessment criteria for the seminar paper and the seminar presentation.

Conditions
See corresponding module information.
Attendance is compulsory.
Preferably at least one module offered by the institute should have been chosen before attending this seminar.

Learning Outcomes
The seminar aims at describing, evaluating, and discussing recent as well as classical topics in continuous optimization. The focus is on the treatment of optimization models and algorithms, also with respect to their practical application.
The student is introduced to the style of scientific work. By focussed treatment of a scientific topic the student learns the basics of scientific investigation and reasoning.
For further development of a scientific work style, master students are particularly expected to critically question the seminar topics.
With regard to the oral presentations the students become acquainted with presentation techniques and basics of scientifc reasoning. Also rethoric abilities may be improved.

Content
The current seminar topics are announced under http://kop.ior.kit.edu at the end of the preceding semester.

Literature
References and relevant sources are announced at the beginning of the seminar.

Course: Seminar in Risk Theory and Actuarial Science [SemFBV3]

Coordinators: Christian Hipp
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	

Learning Control / Examinations

Conditions
See corresponding module information.
Knowledge of statistics and actuary science is an advantage.
The seminar is a good addition to the Bachelor module *Calculation and Control* [IW3BWLFBV2] and to the Master modules *Applications of Actuarial Sciences I/II* [WW4BWLFBV4/5] and *Insurance Statistics* [WW4BWLFBV8]. However these modules are not a prerequisite for the participation in the seminar.

Learning Outcomes

Content

Literature
Will be announced at the end of the recess period.

Course: Seminar in Game and Decision Theory [SemWIOR4]

Coordinators: Siegfried Berninghaus
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations
Term paper and presentation

Conditions
Completion of all 1st an 2nd year modules of the Bachelor Program.
See corresponding module information.

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.

Literature
Will be announced at the end of the recess period.

Course: [24781]

Coordinators: Indra Spiecker genannt Döhmann
Part of the modules: Seminar Module Law (p. 33)[IW3SEMJURA]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

Course: [24357]

Coordinators: Ralf Reussner, Michael Kuperberg, Klaus Melullis
Part of the modules: Seminar Module Law (p. 33)[IW3SEMJURA]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
The assessment of this course consists of a written seminar thesis and a presentations according to section 4 subsection 2 no. 3 study and examination regulations.

Conditions
None.

Learning Outcomes

Content

Course: Seminar: Management and Organization [25915/25916]

Coordinators: Hagen Lindstädt
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

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

Conditions
See corresponding module information.

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.

Literature
The relevant sources are made known during the course.

Course: Service Oriented Computing 1 [25770]

Coordinators: Stefan Tai
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8], Web Information Systems (p. 63)[IW3INAIFB1]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

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).

Conditions
Lecture *AI2* [25033] is recommended.

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. 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 flexibilty 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)

Media
Slides, access to internet resources.

Literature
Will be announced in the lecture.

Course: Security [24941]

Coordinators: Jörn Müller-Quade
Part of the modules: Security (p. 76)[IW3INSICH]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Summer term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes
The student

- knows the theoretic background and the basic mechanisms of computer security and cryptography

- understands the mechanisms of computer security and can explain them,

- can read and understand the current scientific papers,

- can evaluate the safety procedures and can recognize hazards,

- can adapt mechanisms of computer security to new environment.

Content

- Theoretical and practical aspects of computer security

- Development of safety goals and classification of threats

- Presentation and comparison of different formal access control models

- Formal description of authentication systems, presentation and comparison of different authentication methods (passwords, biometrics, challenge-response protocols)

- Analysis of typical vulnerabilities in programs and web applications and development of appropriate protective protection methods / avoidance strategies

- Introduction to key management and Public Key Infrastructure

- Presentation and comparison of current safety certifications

- Block ciphers, hash functions, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (e.g., Diffie-Hellman)

- Furthermore, an introduction to provable security is provided, which presents some of the key security concepts (e.g. IND-CCA).

- Presentation of combinations of cryptographic modules using currently used protocols such as Secure Shell (SSH) and Transport Layer Security (TLS).

Course: Simulation I [25662]

Coordinators: Karl-Heinz Waldmann
Part of the modules: Stochastic Methods and Simulation (p. 62)[IW3OR7], Applications of Operations Research (p. 59)[IW3OR5]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1/2	Winter term	de

Learning Control / Examinations
The assessment consists of an 1h written exam according to Section 4(2), 1 of the examination regulation. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by 0.3 (according to Section 4(2), 3 of the examination regulation).

Conditions
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].

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 continous random variables, statistical analysis of simulated data.

Media
Blackboard, Slides, Flash Animations, Simulation Software

Literature

- Lecture Notes
- K.-H. Waldmann / U. M. Stocker: Stochastische Modelle - Eine anwendungsorientierte Einführung; Springer (2004).

Elective literature:

- A. M. Law / W. D. Kelton: Simulation Modeling and Analysis (3rd ed); McGraw Hill (2000)

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.

Course: Simulation II [25665]

Coordinators: Karl-Heinz Waldmann
Part of the modules: Stochastic Methods and Simulation (p. 62)[IW3OR7]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1/2	Summer term	de

Learning Control / Examinations
The assessment consists of an 1h written exam following §4(2), 1 SPO. Credit from the voluntary computer lab is accounted for in the overall grade raising the exam grade by 0.3 (§4(2), 3 SPO).

Conditions
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].

- *Simulation I*[25662]

not any

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 oftern 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: Variance reduction techniques, simulation of stochastic processes, case studies.

Media
Blackboard, Slides, Flash Animations, Simulation Software

Literature

- Lecture Notes

Elective literature:

- A. M. Law / W. D. Kelton: Simulation Modeling and Analysis (3rd ed); McGraw Hill (2000)

- K.-H. Waldmann / U. M. Stocker: Stochastische Modelle - Eine anwendungsorientierte Einführung; Springer (2004).

Remarks
The lecture is offered irregularly. The curriculum of the next two years is available online.

Course: Software Laboratory: OR Models I [25490]

Coordinators: Stefan Nickel
Part of the modules: Applications of Operations Research (p. 59)[IW3OR5]

ECTS Credits	Hours per week	Term	Instruction language
4.5	1/2	Winter term	de

Learning Control / Examinations
The assessment is a 120 minutes examination, including a written and a practical part (according to §4(2), 1 of the examination regulation).
The examination is held in the term of the software laboratory and the following term.

Conditions
Firm knowledge of the contents from the lecture *Introduction to Operations Research I* [25040] of the module *Operations Research* [WI1OR].

Learning Outcomes
The software laboratory has the goal to make the students familiar with the usage of computers in practical applications of Operations Research. An important benefit lies in the ability to assess and estimate general possibilities and fields of usage of modeling and implementation software for solving OR models in practice. As software-based planning modules are used in many companies, this course provides a reasonable preparation for students for practical planning activities.

Content
After an introduction to general concepts of modelling tools (implementation, data handling, result interpretation, . . .), the program XPress-MP IVE with its modelling language Mosel will be presented in detail.
Subsequently, a broad range of exercises will be discussed. The main goals of the exercises from literature and practical applications are to learn the process of modeling optimization problems as linear or mixed-integer programs, to efficiently utilize the presented tools for solving these optimization problems and to implement heuristic solution procedures for mixed-integer programs.

Remarks
The course is offered in every winter term.
The planned lectures and courses for the next three years are announced online.

Course: Software Engineering I [24518]

Coordinators: Walter F. Tichy, Korbinian Molitorisz
Part of the modules: Software Engineering I (p. 78)[IW3INSWT1]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1/2	Summer term	de

Learning Control / Examinations
The assessment consists of a 60 minute written exam according to § 4 Abs. 2 Nr. 1 SPO.

Conditions
The passing of the module *Foundations in Informatics* [IW1INF1] is obligatory.

Learning Outcomes

Content

Media
slides (pdf), practice sheets

Literature
Elective literature:

- Objektorientierte Softwaretechnik : mit UML, Entwurfsmustern und Java / Bernd Brügge ; Allen H. Dutoit
  München [u.a.] : Pearson Studium, 2004. - 747 S., ISBN 978-3-8273-7261-1

- Lehrbuch der Software-Technik - Software Entwicklung / Helmut Balzert
  Spektrum-Akademischer Vlg; Auflage: 2., überarb. und erw. A. (Dezember 2000), ISBN-13: 978-3827404800

- Software engineering / Ian Sommerville. - 7. ed.
  Boston ; Munich [u.a.] : Pearson, Addison-Wesley, 2004. - XXII, 759 S.
  (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
  ISBN 0-201-63361-2

- C# 3.0 design patterns : [Up-to-date for C#3.0] / Judith Bishop
  Bejing ; Köln [u.a.] : O'Reilly, 2008. - XXI, 290 S.
  ISBN 0-596-52773-X, ISBN 978-0-596-52773-0

Course: Software Engineering II [24076]

Coordinators: Ralf Reussner, Walter F. Tichy
Part of the modules: Software Engineering II (p. 79)[IW3INSWT2]

ECTS Credits	Hours per week	Term	Instruction language
6	3/1	Winter term	de

Learning Control / Examinations
The assessment consists of an wirtten exam (approx. 60 minutes) according to section 4 subsection 2 no. 1 study and examination regulations.

Conditions
None.

Recommendations
The lecture *Software engineering I* should have been attended before.

Learning Outcomes
The students learn approaches and techniques for systematic software engineering. The lecture covers advanced topics, such as model-driven software development, maintainability, statistic testing, and others.

Content
Requirements engineering, software development processes, software quality, software architectures, MDD, Enterprise Software Patterns software maintainability, software security, dependability, embedded software, middleware, statistic testing

Media
Slides, secondary literature

Literature
Will be announced in the lecture.

Course: Software Technology: Quality Management [25730]

Coordinators: Andreas Oberweis
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	de

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.

Conditions
Programming knowledge in Java and basic knowledge of computer science are expected.

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 asses 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.

Literature

- Helmut Balzert: Lehrbuch der Software-Technik. Spektrum-Verlag 1998

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

Elective literature:
Further literature is given in lectures.

Course: Special Topics in Information Engineering & Management [26478]

Coordinators: Christof Weinhardt
Part of the modules: eBusiness and Servicemanagement (p. 36)[IW3BWLISM1]

ECTS Credits	Hours per week	Term	Instruction language
4.5	3	Winter / Summer Term	de

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

Conditions
None.

Learning Outcomes
The student should be able to do a literature review based on a predefined topic in the context of information engneering 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 practical work components should enable the student to learn and independently use scientific methods employed e.g. in case studies or experiments.
The student learns to present his results in a paper and in front of an audience on an academic level. This process is helpful for furhter scientific work like the master or doctoral thesis.

Content
In this course the student should learn to apply the search 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 a interdisciplinary examination. Experiments, case studies or software development can be part of the practical work that offers the students an opportunity to get a deeper insight into the field of Information Engineering and Management. The course also encompases a documentation of the implemented work.

Media

- Power Point
- eLearning Plattform Ilias
- Software tools for development , if needed

Literature
The basic literature will be made available to the student according to the respecitive topic.

Remarks
All the practical seminars offered at the chair of Prof. Dr. Weinhardt can be chosen in the Special Topics in Information Engineering & Management course. The current topics of the practical seminars are available at the following homepage: www.iism.kit.edu/im/lehre

Course: Special Topics of Enterprise Information Systems [SBI]

Coordinators: Andreas Oberweis
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter / Summer Term	

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

Conditions
None.

Learning Outcomes
Students are able to handle methods and instruments in a subarea of "Enterprise Information Systems" and to show the capability to be innovative with regard to applied methods.

The course will impart knowledge of basics and methods in the context of their application in practice. Based on the understanding of the imparted concepts and methods students will be able to choose the appropriate methods and apply them in the right way for problems they will face in their professional life.

Students will be enabled to find arguments for solution approaches and to argue for them.

Content
This course is a placeholder for special courses that are offered in an irregular sequence and cover selected topics in the field of enterprise information systems. These topics include in particular the design and the management of database systems, the computer-support of business processes and strategic planning of information systems and their organization.

Literature
Will be announced at the beginning of the course.

Course: Special Topics of Efficient Algorithms [25700sp]

Coordinators: Hartmut Schmeck
Part of the modules: Algorithms and Applications (p. 67)[IW3INAIFB5]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter / Summer Term	

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 periodwrt (§4 (2), 1 SPO). The exam will be offered in every semester and can be repeated on regular examination dates.
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).

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 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
This course emphasizes the new topics in the area of algorithms, data structures, and computer infrastructures. The exact topics can vary according to the audiences and the time it is held.

Literature
Elective literature:
Will be announced in the lecture.

Remarks
This course can be particularly used for recognising the external courses with the topics in the area of algorithms, data-structures and computer infrastructures but are not associated in other courses in this subject area.

Course: Special Topics of Knowledge Management [25860sem]

Coordinators: Rudi Studer
Part of the modules: Semantic Knowledge Management (p. 64)[IW3INAIFB2]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter / Summer Term	

Learning Control / Examinations
Assesment is provided by a written exam of 60 minutes or an oral exam during the first few weeks after the lecturing period (acc. to §4(2), 1 or 2 SPO). The exam is offered each semester and may be repeated at the regular examination day.

Conditions
The lecture *Angewandte Informatik I - Modellierung* [25070] is a prerequisite.

Learning Outcomes
The students acquire the skills, methods and tools in one specialized topic of "knowledge management" to demonstrate their mastery and innovativeness.
The lecture aims at providing principles and methods in the context of the practical application of KM. On the basis of a fundamental understanding of concepts, methods, and tools, students will be able to work on advanced problems. The students will be able to find and argue for solutions of KM problems.

Content
The lecture deals with special topics in the area of knowledge management (incl. Knowledge Discovery and Semantic Web). The lecture deepens one of the following topics:

- Dynamc and Interoperable Systems in Knowledge Management
- Personal and Process-oriented Knowledge Management
- Formal Concept Analysis
- Semantic Search and Text Mining
- Combination of Social Software and Semantic Web

Literature
Elective literature:
Depends on the actual content.

Course: Special Topics in Management: Management and IT [25907]

Coordinators: Hagen Lindstädt
Part of the modules: Strategy and Organization (p. 43)[IW3BWLUO1]

ECTS Credits	Hours per week	Term	Instruction language
2	1/0	Winter / Summer Term	de

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-eaminations are offered at every ordinary examination date.

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.

Literature
The relevant excerpts and additional sources are made known during the course.

Course: Specific Aspects in Taxation [26129]

Coordinators: Berthold Wigger, A. Presse
Part of the modules: Topics in Finance I (p. 50)[IW3BWLFBV5]

ECTS Credits	Hours per week	Term	Instruction language
4,5	3	Winter term	de

Learning Control / Examinations
The assessment consists of an 1h written exam following Art. 4, para. 2, clause 1 of the examination regulation. The grade for this course equals the grade of the written exam.

Conditions
Basic knowledge of Public Finance is required.

Learning Outcomes

Content
The lecture „Special Aspects of Taxation" focuses on the effects of different taxes. The main emphasis is on German tax legislation. In addition to that, international aspects of taxation, in particular with respect to the European integration, will be discussed.
The lecture consists of four parts: First specific tax problems of corporate, income and consumption taxes are treated. Part two introduces the advantages and disadvantages of each of these taxes, in particular their incidence ("Who actually carries the tax burden?") and their effects within the value chain. The third part then deals with the question how the different taxes contribute to public revenues. Finally, the last part compares tax systems within and outside Europe.
As a special feature, guest lecturers will provide insight into practical aspects of taxation.

Literature
Elective literature:

- Andel, N. (1998): *Finanzwissenschaft*, 4th ed., Mohr Siebeck.

- Betsch, O., Groh, A.P. und Schmidt, K. (2000): *Gründungs- und Wachstumsfinanzierung innovativer Unternehmen*, Oldenbourg.

- Cloer, A. und Lavrelashvili, N. (2008): *Einführung in das Europäische Steuerrecht*, Schmidt Erich.

- Homburg, S.(2007) : *Allgemeine Steuerlehre*, 5th ed.,Vahlen.

- Kravitz, N. (Ed.) (2010) : *Internationale Aspekte der Unternehmensbesteuerung,* Journal of Business Economics, Special Issue 2/2010

- Scheffler, W. (2009) : *Besteuerung von Unternehmen I – Ertrags- Substanz- und Verkehrssteuern*, 11th ed., Müller Jur..

- Scheffler, W. (2009): *Besteuerung von Unternehmen II – Steuerbilanz*, 11th ed., Müller Jur..

- Wigger, B.U. (2006): *Grundzüge der Finanzwissenschaft*; 2nd ed., Springer.

Course: Game Theory I [25525]

Coordinators:	Siegfried Berninghaus
Part of the modules:	Applied Game Theory (p. 54)[IW3VWL1], Strategic Games (p. 55)[IW3VWL4], Microeconomic Theory (p. 56)[IW3VWL6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2	Summer term	de

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.

Conditions

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

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.

Literature

Gibbons, A primer in Game Theory, Harvester-Wheatsheaf, 1992
Holler/Illing, Eine Einführung in die Spieltheorie, 5. Auflage, Springer Verlag, 2003
Gardner, Games for Business and Economics, 2. Auflage, Wiley, 2003
Berninghaus/Ehrhart/Güth, Strategische Spiele, 2. Auflage, Springer Verlag 2006
Elective literature:

- Binmore, Fun and Games, DC Heath, Lexington, MA, 1991

Course: Game Theory II [25369]

Coordinators: Siegfried Berninghaus
Part of the modules: Applied Game Theory (p. 54)[IW3VWL1], Strategic Games (p. 55)[IW3VWL4]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2	Winter term	de

Learning Control / Examinations
The assessment consists of a written exam 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.

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

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 apmplifying 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.

Literature

- Berninghaus/Ehrhart/Güth, Strategische Spiele, 2. Auflage, Springer Verlag, 2006
- van Damme, Stability and Perfection of Nash Equilibria, 2. Auflage, Springer Verlag, 1991

Elective literature:

- Aumann/Hart (edts.), Handbook of Game Theory I-III, Elsevier Publishers, North Holland, 1992/1994/2002

Course: Facility Location and Strategic Supply Chain Management [25486]

Coordinators: Stefan Nickel
Part of the modules: Applications of Operations Research (p. 59)[IW3OR5], Methodical Foundations of OR (p. 61)[IW3OR6], Supply Chain Management (p. 37)[IW3BWLISM2]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

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

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.

Literature
Elective literature:

- Daskin: Network and Discrete Location: Models, Algorithms, and Applications, Wiley, 1995
- Domschke, Drexl: Logistik: Standorte, 4. Auflage, Oldenbourg, 1996
- Francis, McGinnis, White: Facility Layout and Location: An Analytical Approach, 2nd Edition, Prentice Hall, 1992
- Love, Morris, Wesolowsky: Facilities Location: Models and Methods, North Holland, 1988
- Thonemann: Operations Management - Konzepte, Methoden und Anwendungen, Pearson Studium, 2005

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

Course: Statistics and Econometrics in Business and Economics [25325]

Coordinators: Wolf-Dieter Heller
Part of the modules: Statistical Applications of Financial Risk Management (p. 58)[IW3VWL]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/2	Winter term	de

Learning Control / Examinations

Conditions
Basic knowledge in statistics is required.

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 te 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

Literature
e.g.

   • Franke/Härdle/Hafner : Einführung in die Statistik der Finanzmärkte.

   • Ruppert: Statistics and Finance

   • Cochran J.H. : Time Series for Macroeconomics and Finance

Elective literature:
See reading list

Course: Statistics I [25008/25009]

Coordinators: Markus Höchstötter
Part of the modules: Statistics (p. 24)[IW1STAT]

ECTS Credits	Hours per week	Term	Instruction language
5	4/0/2	Summer term	de

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.

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

Literature
Skriptum: Kurzfassung Statistik I
Elective literature:

- Bol, G.: Deskriptive Statistik, 5. Aufl., Oldenbourg, München etc., 2001

- Bol, G.: Wahrscheinlichkeitstheorie, 5. Aufl., Oldenbourg, München etc., 2001

- Bosch, K.: Statistik-Taschenbuch, Oldenbourg, München etc., 1992

- Jambu, M.: Explorative Datenanalyse, G. Fischer, Stuttgart, 1992 Polasek,W.: Explorative Statistik, Springer, Berlin etc., 1994

- Rinne, H.: Taschenbuch der Statistik, 2. Aufl., Harri Deutsch, Frankfurt a. M. etc., 1997

Course: Statistics II [25020/25021]

Coordinators: Markus Höchstötter
Part of the modules: Statistics (p. 24)[IW1STAT]

ECTS Credits	Hours per week	Term	Instruction language
5	4/0/2	Winter term	de

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.

Conditions
It ist recommended to attend the course *Statistics I* [25008/25009] before the course *Statistics II* [25020/25021].

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

Content
B. Probability Theory:

- transformation of probabilities,
- parameters of location and dispersion,
- most importand discrete and continuous distributions,
- covariance and correlation,
- convolution and limit distributions

C. Theory of estimation and testing:

- suffiency of statistics,
- point estimation (optimality, ML-method),
- internal estimations,
- theory of tests (optimality, most important examples of tests)

Media
lecture notes

Literature
Script: Kurzfassung Statistik II
Elective literature:

- Bohley, P.: Statistik, 5. Aufl., Oldenbourg, München etc., 1992
- Bol, G.: Wahrscheinlichkeitstheorie, 5. Aufl., Oldenbourg, München etc., 2001
- Bol, G.: Induktive Statistik, 3. Aufl., Oldenbourg, München etc., 2003
- Bosch, K.: Statistik-Taschenbuch, Oldenbourg, München etc., 1992
- Bünning, H. - Trenkler, G.: Nichtparametrische statistische Methoden, de Gruyter, Berlin, 1994
- Rinne, H.: Taschenbuch der Statistik, 2. Aufl., Harri Deutsch, Frankfurt a. M. etc., 1997
- Schaich, E.: Schätz- und Testmethoden für Sozialwissenschaftler, 2. Aufl., Vahlen, München, 1990
- Zwillinger, D. - Kokoska, S.: Standart Probability and Statistics Tables and Formulae, 2. Aufl., CRC, Boca Raton etc., 2000

Course: Markov Decision Models I [25679]

Coordinators: Karl-Heinz Waldmann
Part of the modules: Stochastic Methods and Simulation (p. 62)[IW3OR7], Methodical Foundations of OR (p. 61)[IW3OR6]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1/2	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The lecture provides students with knowledge of modern techniques of stochastic modelling. Students are able to properly describe and analyze basic stochastic systems.

Content
Markov Chains, Poisson Processes, Markov Chains in Continuous Time, Queuing Systems

Media
Blackboard, Slides, Flash Animations, Simulation Software

Literature
Waldmann, K.H. , Stocker, U.M. (2004): Stochastische Modelle - eine anwendungsorientierte Einführung; Springer
Elective literature:
Norris, J.R. (1997): Markov Chains; Cambridge University Press
Bremaud, P. (1999): Markov Chains, Gibbs Fields, Monte Carlo Simulation, and Queues; Springer

Course: Material Flows in Industrial Production [25960]

Coordinators: Michael Hiete
Part of the modules: Industrial Production I (p. 44)[IW3BWLIIP1]

ECTS Credits	Hours per week	Term	Instruction language
3.5	2/0	Winter term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes
Students shall be aware of issues concerning the material and energy flow in an economy and shall apply strategies to solve these issues.

Content
The analysis and management of material flows on the company level and above will be the focus of this lecture. Herein, the discussion will be about cost-effective and environmentally acceptable steps to avoid, abate and recycle emissions and waste as well as ways of efficient resources handling. As methods material flow analysis (MFA), life cycle assessment (LCA) and OR methods, e.g. for decision support, are introduced.
Topics:
- regulations related to materials and substances
- raw materials, reserves and their availabilities/lifetimes
- material and substance flow analysis (MFA/SFA)
- material related ecoprofiles, e.g. Carbon Footprint
- LCA
- resource efficiency
- emission abatement
- waste management and closed-loop recycling
- raw material oriented production systems
- environmental management (EMAS, ISO 14001, Ecoprofit), eco-controlling

Media
Media will be provided on e-learning platform.

Literature
will be announced in the course

Remarks
This lecture is called "Stoffstromorientierte Produktionswirtschaft" since the winter term 2010/2011.

Course: Strategic Human Resource Management [25930]

Coordinators: Christine Harbring
Part of the modules: Human Resource Management (p.)[IW3BWLIAP1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Winter term	de

Learning Control / **Examinations**
The examination will be in form of a written exam acc. to §4(2), 1 ER

Conditions
None.

Learning Outcomes

Content

Course: Tactical and Operational Supply Chain Management [25488]

Coordinators: Stefan Nickel
Part of the modules: Applications of Operations Research (p. 59)[IW3OR5], Stochastic Methods and Simulation (p. 62)[IW3OR7], Supply Chain Management (p. 37)[IW3BWLISM2]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

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

Conditions
Successful completion of the module *Introduction to Operations Research* [IW1OR].

Learning Outcomes
The main goal of the lecture is the presentation of fundamental techniques from procurement and distribution logistics. A further aspect is set on methods from inventory management and lot sizing. Students acquire the ability to efficiently utilize quantitative models from transportation planning (long-distance and distribution planning), inventory management and lot sizing in production. The introduced methods will be discussed in more detail and illustrated with case-studies in the accompanying exercises

Content
The planning of material transport is an essential element of Supply Chain Management. By linking transport connections across different facilities, the material source (production plant) is connected with the material sink (customer).
The general supply task can be formulated as follows (cf. Gudehus): For given material flows or shipments, choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints. The main goal of the inventory management is the optimal determination of order quantities in terms of minimization of fixed and variable costs subject to resource constraints, supply availability and service level requirements. Similarly, the problem of lot sizing in production considers the determination of the optimal amount of products to be produced in a time slot.
The course includes an introduction to basic terms and definitions of Supply Chain Management and a presentation of fundamental quantitative planning models for distribution, vehicle routing, inventory management and lot sizing. Furthermore, case studies from practice will be discussed in detail.

Literature
Elective literature:

- Domschke: Logistik: Transporte, 5. Auflage, Oldenbourg, 2005
- Domschke: Logistik: Rundreisen und Touren, 4. Auflage, Oldenbourg, 1997
- Ghiani, Laporte, Musmanno: Introduction to Logistics Systems Planning and Control, Wiley, 2004
- Gudehus: Logistik, 3. Auflage, Springer, 2005
- Simchi-Levi, Kaminsky, Simchi-Levi: Designing and Managing the Supply Chain, 3rd edition, McGraw-Hill, 2008
- Silver, Pyke, Peterson: Inventory management and production planning and scheduling, 3rd edition, Wiley, 1998

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

Course: Telematics [24128]

Coordinators: Martina Zitterbart
Part of the modules: Telematics (p. 71)[IW3INTM]

ECTS Credits	Hours per week	Term	Instruction language
4	2	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
Knowledge of the lecture *Introduction in Computer Networks* [24519] or similar lectures is required.

Learning Outcomes
This course details selected protocols, architectures, techniques, and algorithms, which were already presented in the course *Introduction in Computer Networks*. Thus, overall knowledge and knowledge about problems that occur within a world-wide and dynamic network as well as solutions that are applied in order to avoid these problems is imparted in this course.

Content
This course addresses protocols, architectures, techniques, and algorithms that are used, e.g., for Internet routing and establishing of reliable end-to-end communication associations. In addition to different media access control mechanisms in local area networks further communication systems, e.g. line-switched ISDN, are detailed. It is intended that students additionally understand which possibilities for network management and administration currently exist.

Media
Slides.

Literature
S. Keshav. *An Engineering Approach to Computer Networking*. Addison-Wesley, 1997

J.F. Kurose, K.W. Ross. *Computer Networking: A Top-Down Approach Featuring the Internet*. 4rd Edition, Addison-Wesley, 2007

W. Stallings. *Data and Computer Communications*. 8th Edition, Prentice Hall, 2006
Elective literature:

- D. Bertsekas, R. Gallager. *Data Networks*. 2nd Edition, Prentice-Hall, 1991
- F. Halsall. *Data Communications, Computer Networks and Open Systems*. 4th Edition, Addison-Wesley Publishing Company, 1996
- W. Haaß. *Handbuch der Kommunikationsnetze*. Springer, 1997
- A.S. Tanenbaum. *Computer-Networks*. 4th Edition, Prentice-Hall, 2004
- Internet standards
- Selected journal arcticles

Course: Theoretical Foundations of Computer Science [24005]

Coordinators: Dorothea Wagner
Part of the modules: Theoretical Informatics (p. 17)[IW2INF3]

ECTS Credits	Hours per week	Term	Instruction language
7	3/1	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Learning Outcomes

The student

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

Content

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

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

Media

Slides (pdf), lecture notes, practice sheets.

Literature
Elective literature:

- Uwe Schöning: Theoretische Informatik - kurz gefasst. Spektrum (2001).
- Ingo Wegener: Theoretische Informatik. Teubner (1999)
- Ingo Wegener: Kompedium theoretische Informatik. Teubner (1996).

Course: Management and Strategy [25900]

Coordinators: Hagen Lindstädt
Part of the modules: Strategy and Organization (p. 43)[IW3BWLUO1]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Summer term	de

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.

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.

Literature

- Grant, R.M.: *Contemporary Strategy Analysis.* Blackwell, 5. Aufl. Massachusetts 2005.
- Lindstädt, H.; Hauser, R.: *Strategische Wirkungsbereiche von Unternehmen.* Gabler, Wiesbaden 2004.

The relevant excerpts and additional sources are made known during the course.

Course: Corporate Planning and Operations Research [25158]

Coordinators: Wolfgang Gaul
Part of the modules: Specialization in Customer Relationship Management (p. 40)[IW3BWLISM5]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Winter term	de

Learning Control / Examinations
See module description.

Conditions
Basics of operations research are assumed.

Learning Outcomes

Content

Literature
Will be announced in the lecture. Further literature references are announced in the script.

Course: Compensation and Motivation [25969]

Coordinators: Christine Harbring
Part of the modules: Human Resource Management (p. 53)[IW3BWLIAP1]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Summer term	de

Learning Control / Examinations
The examination will be in form of a written exam acc. to §4(2), 1 ER

Conditions
None.

Learning Outcomes

Content

Course: Networked IT-Infrastructures [24074]

Coordinators: Wilfried Juling
Part of the modules: Information Services in Networks (p. 66)[IW3INAIFB4]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
Dependencies according to the module.

Learning Outcomes
The goal of this lecture is to introduce the fundamental models, approaches and technologies used in today's digital telecommunication networks. The topics covered in this lecture are strongly aligned with the OSI Reference Model, a broadly accepted layer model for describing communication systems.

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 alogrithms 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.

Literature

- A.S. Tanenbaum, Computer Networks Prentice Hall, 4. Auflage, ISBN 0130661023, 2002.

- Larry L. Peterson, Bruce S. Davie, Computer Networks - A Systems Approach, 3rd ed., Morgan Kaufmann Publishers, 2003.

Elective literature:

- F. Halsall, Data Communications, Computer Networks and OSI, Addison-Wesley, 4. Auflage, ISBN 0-201-18244-0, 1997.

- J.F. Kurose, K.W. Ross, Computer Networking - A Top-Down Approach featuring the Internet. Addison-Wesley, 2005.

Course: Economics I: Microeconomics [25012]

Coordinators: Siegfried Berninghaus
Part of the modules: Economics (p. 22)[IW1VWL]

ECTS Credits	Hours per week	Term	Instruction language
5	3/0/2	Winter term	de

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 descritpion of the examination modalities will be given by the respective lecturer.
The main exam takes place subsequent to the lectur. The re-examination is offered at the same examination period. 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.

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

Literature

   • H. Varian, Grundzüge der Mikroökonomik, 5. edition (2001), Oldenburg Verlag

   • Pindyck, Robert S./Rubinfeld, Daniel L., Mikroökonomie, 6. Aufl., Pearson. Münschen, 2005

   • Frank, Robert H., Microeconomics and Behavior, 5. Aufl., McGraw-Hill, New York, 2005

Elective 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: Economics III: Introduction in Econometrics [25016]

Coordinators: Markus Höchstötter
Part of the modules: Statistical Applications of Financial Risk Management (p. 58)[IW3VWL]

ECTS Credits	Hours per week	Term	Instruction language
5	2/2	Summer term	de

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

Conditions
Knowledge of the lectures Statistics I + II is required.

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

Literature

- Von Auer: Ökonometrie ISBN 3-540-00593-5

- Goldberger: A course in Econometrics ISBN 0-674-17544-1

- Gujarati. Basic Econometrics ISBN 0-07-113964-8

- Schneeweiß: Ökonometrie ISBN 3-7908-0008-2

Elective literature:
Additional literature will be suggested in course

Course: Theory of Economic Growth [25543]

Coordinators: Marten Hillebrand
Part of the modules: Macroeconomic Theory (p. 57)[IW3VWL8]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Summer term	en

Learning Control / Examinations
According to the attendance the assessment consists of a written or an oral exam at the beginning of the recess period (according to Section 4 (2), 1 or 2 of the examination regulation.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
Basic knowledge in micro- and macroeconomics, as conveyed in the courses *Economics I: Microeconomics* [25012] and *Economics II: Macroeconomics* [25014], is assumed.
According the focus of the course quantitativ-mathematical modelling should be in participiant's interest.

Learning Outcomes

Content

Course: Web Engineering [24124]

Coordinators: Martin Nußbaumer
Part of the modules: Information Services in Networks (p. 66)[IW3INAIFB4]

ECTS Credits	Hours per week	Term	Instruction language
4	2/0	Winter term	de

Learning Control / Examinations
The assessment is explained in the module description.

Conditions
None.

Recommendations
Knowledge of the lecture *Software Engineering II*.

Learning Outcomes

- Students know fundamentals as well as current methodologies and techniques in the field of Web Engineering

- Students have gained insight into existing Web-oriented application platforms and development frameworks, and have the basic knowledge for system design close to current practices.

- Students can apply methods for analyzing current standards and technologies of the Web. Students are able to understand and interpret scientific papers and standard specifications and are confident in using the domain-specific terminology.

- Students are able to analyze, structure and describe problems in the field of Web Engineering as well as to design Web-based system architectures.

Content
This lecture will discuss the systematic construction of Web-based applications and systems by focusing on the different phases and aspects of the Web application lifecycle. It helps students to look at the Web phenomenon from different perspectives - e.g. as a Web designer, analyst, architect, component engineer, program manager, product manager or CIO. Students learn how to engineer Web applications and agile systems from requirements engineering, planning, design, development, testing, deployment and up to operation, maintenance and evolution. Many examples are shown and discussed, demonstrating the need for expecting change and staying agile. As this is not a programming course, students will be introduced to the core technology aspects and are encouraged to consolidate the details.

Media
Slides

Literature
Will be announced in the lecture.

Course: [24522]

Coordinators:
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
1	0/1	Summer term	de

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

Remarks
The module is only offered in the summer term 2010.

Course: Competition in Networks [26240]

Coordinators: Kay Mitusch
Part of the modules: Specialization in Customer Relationship Management (p. 40)[IW3BWLISM5], Applied Game Theory
                           (p. 54)[IW3VWL1], Microeconomic Theory (p. 56)[IW3VWL6]

ECTS Credits	Hours per week	Term	Instruction language
4,5	2/1	Winter term	de

Learning Control / Examinations

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

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.

Literature
Will be announced in the lecture.

Course: Seminar Economic Theory [SemWIOR2]

Coordinators: Clemens Puppe
Part of the modules: Seminar Module Economic Sciences (p. 32)[IW3SEMWIWI]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter / Summer Term	de

Learning Control / Examinations

Conditions
See corresponding module information.
At least one of the courses *Game Theory I* [25525] and *Welfare Economics* [25517] should have been attended beforehand.

Learning Outcomes

Content

Literature
Will be announced at the end of the recess period.

Course: Knowledge Management [25740]

Coordinators: Rudi Studer
Part of the modules: Semantic Knowledge Management (p. 64)[IW3INAIFB2]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Winter term	de

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.

Conditions
Basics in logic, e.g. from lecture Foundations of Informatics 1.

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 companies, knowledge is increasingly important for fullfilling central tasks (such as continuous business process improvement, increasing innovation, increasing customer satisfaction, strategic planning etc). Therefore, knowledge management has become a critical success factor.
The lecture covers 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 emphasize computer-based support for knowledge management, such as:

- Ontology-based Knowledge Management

- Communities of Practice, Collaboration Tools, Social Software

- Business-process Oriented Knowledge Management

- Personal Knowledge Management

- Case Based Reasoning (CBR)

Media
Slides and scientific publications as reading material.

Literature

- I. Nonaka, H. Takeuchi: The Knowledge Creating Company. Oxford University Press 1995.

- G. Probst, S. Raub, K. Romhardt: Wissen managen: Wie Unternehmen ihre wertvollste Ressource optimal nutzen. Gabler, Wiesbaden, 5. überarb. Auflage, 2006.

- S. Staab, R. Studer (eds.): Handbook on Ontologies, ISBN 3-540-70999-1, Springer Verlag, 2009.

- A. Back, N. Gronau, K. Tochtermann: Web 2.0 in der Unternehmenspraxis - Grundlagen, Fallstudien und Trends zum Einsatz von Social Software. Oldenbourg Verlag München 2008.

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

Elective literature:

1. P. Hitzler, M Krötzsch, S. Rudolph, Y. Sure: Semantic Web: Grundlagen, ISBN 3-540-33993-0, Springer Verlag, 2008

2. Abecker, A., Hinkelmann, K., Maus, H., Müller, H.J., (Ed.): Geschäftsprozessorientiertes Wissensmanagement, Mai 2002.VII, 472 S. 70 Abb. Geb. ISBN 3-540-42970-0, Springer Verlag

3. Dieter Fensel. Spinning the Semantic Web. 2003 (ISBN 0262062321).

4. Tim Berners-Lee. Weaving the Web. Harper 1999 geb. 2000 Taschenbuch.

Course: Welfare Economics [25517]

Coordinators: Clemens Puppe
Part of the modules: Microeconomic Theory (p. 56)[IW3VWL6]

ECTS Credits	Hours per week	Term	Instruction language
4.5	2/1	Summer term	de

Learning Control / Examinations
The assessment consists of a written exam at the end of the semester (according to Section 4 (2), 1 or 2 of the examination regulation.
The exam takes place in every semester. Re-examinations are offered at every ordinary examination date.

Conditions
The courses *Economics I: Microeconomics* [25012] and *Economics II: Macroeconomics* [25014] have to be completed beforehand.

Learning Outcomes

Content

Literature
Elective literature:

- J. Rawls: *A Theory of Justice*. Harvard University Press (1971)
- J. Roemer: *Theories of Distributive Justice*. Harvard University Press (1996)

Course: Workflowmanagement-Systems [wms]

Coordinators: Jutta Mülle
Part of the modules: Foundations of Information Systems (p. 69)[IW3INGIS]

ECTS Credits	Hours per week	Term	Instruction language
3	2	Winter term	de

Learning Control / Examinations
It will be announced in advance if the assessment consists of an 1h written exam according to section 4 subsection 2 no. 1 study and examination regulations or of a 20 minute oral examination following according to section 4 subsection 2 no. 2 study and examination regulations.

Conditions
None.

Recommendations
Knowledge about database systems, e.g. from the lecture *Database Systems* [24516].

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.

Literature

- W.M.P. van der Aalst. The Application of Petri Nets to Workflow Management. The Journal of Circuits, Systems and Computers, Seiten 1-45, Band 7:1, 1998.
- S. Jablonski, M. Böhm, W. Schulze (Hrsg.): Workflow-Management - Entwicklung von Anwendungen und Systemen. dpunkt-Verlag, Heidelberg, 1997
- Frank Leymann, Dieter Roller: Production Workflows - Concepts and Techniques. Prentice-Hall, 2000
- W.M.P. van der Aalst: Workflow Management: Models, Methods, and Systems. MIT Press, 368 pp., 2002
- Michael Havey: Essential Business Process Modeling. O'Reilly Media, Inc., 2005

Elective literature:

- M. Dumas, Wil M. P. van der Aalst, Arthur H. M. ter Hofstede (eds.): Process-Aware Information Systems. Wiley, 2005
- D. Harel: Statecharts: A Visual Formalism for Complex Systems, Science of Computer Programming Vol. 8, 1987.
- Dirk Wodtke, Gerhard Weikum A Formal Foundation for Distributed Workflow Execution Based on State Charts. Foto N. Afrati, Phokion Kolaitis (Eds.): Database Theory - ICDT '97, 6th International Conference, Delphi, Greece, January 8-10, 1997, Proceedings. Lecture Notes in Computer Science 1186, Springer Verlag, Seiten 230-246, 1997.
- H.M.W. Verbeek, T. Basten, and W.M.P. van der Aalst Diagnosing workflow processes using Woflan. Computing Science Report 99/02, Eindhoven University of Technology, Eindhoven, 1999.

Remarks
The module is no longer offered, examination is possible until summer term 2011.
Starting with the winter term 2010/11 the new module *Konzepte und Anwendungen von Workflowsystemen* [IN4INKAW] (5 credit points) is offered.

Course: Workflow-Management [25726]

Coordinators: Andreas Oberweis
Part of the modules: Business Processes and Information Systems (p. 68)[IW3INAIFB8]

ECTS Credits	Hours per week	Term	Instruction language
5	2/1	Summer term	de

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.

Conditions
Knowledge of course *Applied Informatics I - Modelling* [25070] is expected.

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.

Literature

- M. Dumas, W. van der Aalst, A. H. ter Hofstede (Hrsg.): Process Aware Information Systems. Wiley-Interscience, 2005

- J.F. Chang: Business Process Management. Auerbach Publications, 2006

Elective literature:

- W. van der Aalst, H. van Kees: Workflow Management: Models, Methods and Systems, Cambridge 2002: The MIT Press

- G. Vossen, J. Becker (Hrsg.): Geschäftsprozessmodellierung und Workflow-Management. Modelle, Methoden, Werkzeuge; Int. Thomson Pub. Company, 1996.

- A. Oberweis: Modellierung und Ausführung von Workflows mit Petri-Netzen. Teubner-Reihe Wirtschaftsinformatik, B.G. Teubner Verlag, 1996.

- G. Alonso, F. Casati, H. Kuno, V. Machiraju: Web Services, 2004, Springer Verlag, Heidelberg 1997

- S. Jablonski, C. Bussler: Workflow-Management, Modeling Concepts, Architecture and Implementation, Int. Thomson Computing Press, 1996.

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Studien- und Prüfungsordnung der Universität Karlsruhe (TH) für den Bachelorstudiengang Informationswirtschaft

vom 15. April 2009

Aufgrund von § 34 Abs. 1 Satz 1 des Landeshochschulgesetzes (LHG) vom 1. Januar 2005 hat die beschließende Senatskommission für Prüfungsordnungen der Universität Karlsruhe (TH) am 13. Februar 2009 die folgende Studien- und Prüfungsordnung für den Bachelorstudiengang Informationswirtschaft beschlossen.

Der Rektor hat seine Zustimmung am 15. April 2009 erteilt.

Inhaltsverzeichnis

Die Universität Karlsruhe (TH) hat sich im Rahmen der Umsetzung des Bolognaprozesses zum Aufbau eines Europäischen Hochschulraumes zum Ziel gesetzt, dass am Abschluss der Studierendenausbildung an der Universität Karlsruhe (TH) der Mastergrad stehen soll. Die Universität Karlsruhe (TH) sieht daher die an der Universität Karlsruhe (TH) angebotenen konsekutiven Bachelor- und Masterstudiengänge als Gesamtkonzept mit konsekutivem Curriculum.

Aus Gründen der Lesbarkeit ist in dieser Satzung nur die männliche Sprachform gewählt worden. Alle personenbezogenen Aussagen gelten jedoch stets für Frauen und Männer gleichermaßen.

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 der Studierende 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 Studiengang Informationswirtschaft (englischsprachig: Information Engineering and Management) verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

(1) Die Regelstudienzeit beträgt sechs Semester. Sie umfasst neben den Lehrveranstaltungen ein Berufspraktikum, 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. Der Studienplan beschreibt Art, Umfang und Zuordnung der Module zu einem Fach sowie die Möglichkeiten, Module untereinander zu kombinieren. Die Fächer und ihr Umfang werden in § 17 definiert.

(3) Der für das Absolvieren von Lehrveranstaltungen und Modulen vorgesehene Arbeitsaufwand wird in Leistungspunkten (Credits) ausgewiesen. Die Maßstäbe für die Zuordnung von Leistungspunkten entsprechen dem ECTS (European Credit Transfer System). Ein Leistungspunkt entspricht einem Arbeitsaufwand von etwa 30 Stunden.

(4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studienleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 180 Leistungspunkte.

(5) Die Verteilung der Leistungspunkte im Studienplan auf die Semester hat in der Regel gleichmäßig zu erfolgen.

(6) Lehrveranstaltungen können in englischer Sprache angeboten werden.

(7) Profilmodule dienen der Profilbildung im Studiengang und der transparenten Darstellung der Lehrziele des Studiengangs durch eine Lehrzielhierarchie. Profilmodule werden durch die Module nach § 17 Abs. 3 und Abs. 4 gebildet. Jeweils beim Abschluss eines Moduls des Profilmoduls werden die Leistungspunkte dem Profilmodul angerechnet. Die Zuordnung der Module und Seminare zu Profilmodulen beschreibt der Studienplan.

§ 4 Aufbau der Prüfungen

(1) Die Bachelorprüfung besteht aus einer Bachelorarbeit und Fachprüfungen, jede Fachprüfung aus einer oder mehreren Modulprüfungen, jede Modulprüfung aus einer oder mehreren Modulteilprüfungen. Eine Modulteilprüfung besteht aus mindestens einer Erfolgskontrolle.

(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). Ausgenommen hiervon sind die Prüfungen nach § 17 Abs. 4.

§ 5 Anmeldung und Zulassung zu den Prüfungen

(1) Um an schriftlichen und/oder mündlichen Prüfungen (§ 4 Abs. 2, Nr. 1 und 2) teilnehmen zu können, muss sich der Studierende schriftlich oder per Online-Anmeldung beim Studienbüro anmelden. Hierbei sind die gemäß dem Studienplan für die jeweilige Modulprüfung notwendigen Studienleistungen nachzuweisen. Dies gilt auch für die Anmeldung zur Bachelorarbeit.

(2) Um zu schriftlichen und/oder mündlichen Prüfungen (§ 4 Abs. 2, Nr. 1 und 2) in einem bestimmten Modul zugelassen zu werden, muss der Studierende 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.

(3) Die Zulassung darf nur abgelehnt werden, wenn

1. der Studierende in einem mit der Informationswirtschaft vergleichbaren oder einem verwandten Studiengang bereits eine Diplomvorprüfung, Diplomprüfung, Bachelor- oder Masterprüfung endgültig 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.

§ 6 Durchführung von Prüfungen und Erfolgskontrollen

(1) Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach durchgeführt.

(2) Die Art der Erfolgskontrolle (§ 4 Abs. 2, Nr. 1 - 3) der einzelnen Lehrveranstaltungen wird vom Prüfer der betreffenden Lehrveranstaltung in Bezug auf die Lehrinhalte der Lehrveranstaltung und die Lehrziele des Moduls festgelegt. Die Art der Erfolgskontrollen, ihre Häufigkeit, Reihenfolge und Gewichtung, die Bildung der Lehrveranstaltungsnote und der Modulnote sowie

Prüfer müssen mindestens sechs Wochen vor Semesterbeginn bekannt gegeben werden. Im Einvernehmen von Prüfer und Studierendem kann in begründeten Ausnahmefällen die Art der Erfolgskontrolle auch nachträglich geändert werden. Dabei ist jedoch § 4 Abs. 3 zu berücksichtigen. Hierüber entscheidet der Prüfungsausschuss auf Antrag.

(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) Weist ein Studierender nach, dass 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 Vorsitzender – gestatten, Erfolgskontrollen in einer anderen Form zu erbringen.

(5) Bei Lehrveranstaltungen in englischer Sprache können mit Zustimmung des Studierenden die entsprechenden Erfolgskontrollen in englischer Sprache abgenommen werden.

(6) Schriftliche Prüfungen (§ 4 Abs. 2, Nr. 1) sind in der Regel von zwei Prüfern nach § 15 Abs. 2 oder 3 zu bewerten. Die Note ergibt sich aus dem arithmetischen Mittel der Einzelbewertungen. Entspricht das arithmetische Mittel keiner der in § 7 Abs. 2 Satz 2 definierten Notenstufen, so ist auf die nächstliegende Notenstufe zu runden. Bei gleichem Abstand ist auf die nächstbessere Notenstufe zu runden. Das Bewertungsverfahren soll sechs Wochen nicht überschreiten. Schriftliche Einzelprüfungen dauern mindestens 60 und höchstens 240 Minuten.

(7) Mündliche Prüfungen (§ 4 Abs. 2, Nr. 2) sind von mehreren Prüfern (Kollegialprüfung) oder von einem Prüfer in Gegenwart eines Beisitzenden als Gruppen- oder Einzelprüfungen abzunehmen und zu bewerten. Vor der Festsetzung der Note hört der Prüfer die anderen an der Kollegialprüfung mitwirkenden Prüfer an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 45 Minuten pro Studierenden. Dies gilt auch für die mündliche Nachprüfung gemäß § 8 Abs. 3.

(8) Die wesentlichen Gegenstände und Ergebnisse der mündlichen Prüfung in den einzelnen Fächern sind in einem Protokoll festzuhalten. Das Ergebnis der Prüfung ist dem Studierenden im Anschluss an die mündliche Prüfung bekannt zu geben.

(9) Studierende, die sich in einem späteren Prüfungszeitraum der gleichen Prüfung unterziehen wollen, werden entsprechend den räumlichen Verhältnissen als Zuhörer bei mündlichen Prüfungen zugelassen. Die Zulassung erstreckt sich nicht auf die Beratung und Bekanntgabe der Prüfungsergebnisse. Aus wichtigen Gründen oder auf Antrag des zu prüfenden Studierenden ist die Zulassung zu versagen.

(10) Für Erfolgskontrollen anderer Art sind angemessene Bearbeitungsfristen einzuräumen und Abgabetermine festzulegen. Dabei ist durch die Art der Aufgabenstellung und durch entsprechende Dokumentation sicherzustellen, dass die erbrachte Studienleistung dem Studierenden zurechenbar ist. Die wesentlichen Gegenstände und Ergebnisse einer solchen Erfolgskontrolle sind in einem Protokoll festzuhalten.

(11) 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.

(12) Bei mündlich durchgeführten Erfolgskontrollen anderer Art muss neben dem Prüfer ein Beisitzer anwesend sein, der zusätzlich zum Prüfer die Protokolle zeichnet.

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§ 7 Bewertung von Prüfungen und Erfolgskontrollen

(1) Das Ergebnis einer Erfolgskontrolle wird von den jeweiligen Prüfern in Form einer Note festgesetzt.

(2) Im Bachelorzeugnis dürfen nur folgende Noten verwendet werden:

1	:	sehr gut (very good)	:	hervorragende Leistung,
2	:	gut (good)	:	eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt,
3	:	befriedigend (satisfactory)	:	eine Leistung, die durchschnittlichen Anforderungen entspricht,
4	:	ausreichend (sufficient)	:	eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt,
5	:	nicht ausreichend (failed)	:	eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt.

Für die Bachelorarbeit, Modulprüfungen, Modulteilprüfungen und Profilmodule 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
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 Erfolgskontrollen anderer Art 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 in demselben Studiengang bzw. einem darauf aufbauenden konsekutiven Masterstudiengang nur einmal angerechnet werden.

(6) Erfolgskontrollen anderer Art dürfen in Modulteilprüfungen oder Modulprüfungen nur eingerechnet werden, wenn die Benotung nicht nach Absatz 3 erfolgt ist. Die zu dokumentierenden Erfolgskontrollen und die daran geknüpften Bedingungen werden im Studienplan festgelegt.

(7) Eine Modulteilprüfung ist bestanden, wenn die Note mindestens „ausreichend" (4.0) ist.

(8) Eine Modulprüfung ist dann bestanden, wenn die Modulnote mindestens „ausreichend" (4.0) ist. Die Modulprüfung und die Bildung der Modulnote werden im Studienplan geregelt. Die differenzierten Lehrveranstaltungsnoten (Absatz 2) sind bei der Berechnung der Modulnoten als Ausgangsdaten zu verwenden. Enthält der Studienplan keine Regelung darüber, wann eine Modulprüfung bestanden ist, so ist diese Modulprüfung dann endgültig nicht bestanden, wenn eine dem Modul zugeordnete Modulteilprüfung endgültig nicht bestanden wurde.

(9) Die Ergebnisse der Bachelorarbeit, der Modulprüfungen bzw. der Modulteilprüfungen, der Erfolgskontrollen anderer Art sowie die erworbenen Leistungspunkte werden durch das 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 über die im Studienplan definierten Modulprüfungen nachgewiesen wird.

(11) Die Gesamtnote der Bachelorprüfung, die Fachnoten und die Modulnoten lauten:

		bis	1.5	:	sehr gut (very good)
von	1.6	bis	2.5	:	gut (good)
von	2.6	bis	3.5	:	befriedigend (satisfactory)
von	3.6	bis	4.0	:	ausreichend (sufficient)

(12) Zusätzlich zu den Noten nach Absatz 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 Studierenden definiert, die diese Note in der Regel erhalten. Dabei ist von einer mindestens fünfjährigen Datenbasis über mindestens 30 Studierende auszugehen. Für die Ermittlung der Notenverteilungen, die für die ECTS-Noten erforderlich sind, ist das Studienbüro der Universität zuständig.

(13) Bis zum Aufbau einer entsprechenden Datenbasis wird als Übergangsregel die Verteilung der Vordiplomsnoten des Diplomstudiengangs Informationswirtschaft per 31. Juli 2005 zur Bildung dieser Skala für alle Module des Bachelorstudiengangs herangezogen. Diese Verteilung wird jährlich gleitend über mindestens fünf Jahre mit mindestens 30 Studierenden jeweils zu Beginn des Studienjahres für jedes Modul, die Fachnoten und die Gesamtnote angepasst und in diesem Studienjahr für die Festsetzung der ECTS-Note verwendet.

§ 8 Orientierungsprüfungen, Wiederholung von Prüfungen und Erfolgskontrollen, Erlöschen des Prüfungsanspruchs

(1) Die Modulprüfungen im Modul Grundlagen der Informatik und im Modul Volkswirtschaftslehre sind bis zum Ende des Prüfungszeitraums des zweiten Fachsemesters abzulegen (Orientierungsprüfungen).

Wer die Orientierungsprüfungen einschließlich etwaiger Wiederholungen bis zum Ende des Prüfungszeitraums des dritten Fachsemesters nicht erfolgreich abgelegt hat, verliert den Prüfungsanspruch im Studiengang, es sei denn, dass er die Fristüberschreitung nicht zu vertreten hat;

hierüber entscheidet der Prüfungsausschuss auf Antrag des Studierenden. Eine zweite Wiederholung von Prüfungen der Orientierungsprüfungen ist ausgeschlossen.

(2) Studierende können eine nicht bestandene schriftliche Prüfung (§ 4 Abs. 2, Nr. 1) einmal wiederholen. Wird eine schriftliche Wiederholungsprüfung mit „nicht ausreichend" bewertet, so findet eine mündliche Nachprüfung im zeitlichen Zusammenhang mit dem Termin der nicht bestandenen Prüfung statt. In diesem Falle kann die Note dieser Prüfung nicht besser als „ausreichend" sein.

(3) Studierende können eine nicht bestandene mündliche Prüfung (§ 4 Abs. 2, Nr. 2) einmal wiederholen.

(4) Wiederholungsprüfungen nach Absatz 2 und 3 müssen in Inhalt, Umfang und Form (mündlich oder schriftlich) der ersten Prüfung entsprechen. Ausnahmen kann der zuständige Prüfungsausschuss auf Antrag zulassen. Fehlversuche an anderen Hochschulen sind anzurechnen.

(5) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Abs. 2, Nr. 3) wird im Studienplan geregelt.

(6) Eine zweite Wiederholung derselben schriftlichen oder mündlichen Prüfung ist nur in Ausnahmefällen zulässig. Einen Antrag auf Zweitwiederholung hat der Studierende schriftlich beim Prüfungsausschuss zu stellen. Über den ersten Antrag eines Studierenden auf Zweitwiederholung entscheidet der Prüfungsausschuss, wenn er den Antrag genehmigt. Wenn der Prüfungsausschuss diesen Antrag ablehnt, entscheidet der Rektor. Über weitere Anträge auf Zweitwiederholung entscheidet nach Stellungnahme des Prüfungsausschusses der Rektor. Absatz 2 Satz 2 und 3 gelten entsprechend.

(7) Die Wiederholung einer bestandenen Erfolgskontrolle ist nicht zulässig.

(8) Eine Fachprüfung ist endgültig nicht bestanden, wenn mindestens ein Modul des Faches endgültig nicht bestanden ist.

(9) Die Bachelorarbeit kann bei einer Bewertung mit „nicht ausreichend" einmal wiederholt werden. Eine zweite Wiederholung der Bachelorarbeit ist ausgeschlossen.

(10) Ist gemäß § 34 Abs. 2 Satz 3 LHG die Bachelorprüfung bis zum Ende des neunten Fachsemesters dieses Studiengangs einschließlich etwaiger Wiederholungen nicht vollständig abgelegt, so erlischt der Prüfungsanspruch im Studiengang, es sei denn, dass der Studierende die Fristüberschreitung nicht zu vertreten hat. Die Entscheidung darüber trifft der Prüfungsausschuss. Die Entscheidung über eine Fristverlängerung und über Ausnahmen von der Fristregelung trifft der Prüfungsausschuss.

§ 9 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß

(1) Der Studierende kann bei schriftlichen Prüfungen ohne Angabe von Gründen bis einen Tag (24 Uhr) vor dem Prüfungstermin zurücktreten (Abmeldung). Bei mündlichen Prüfungen muss der Rücktritt spätestens drei Werktage vor dem betreffenden Prüfungstermin erklärt werden (Abmeldung). Ein Rücktritt von einer mündlichen Prüfung weniger als drei Werktage vor dem betreffenden Prüfungstermin ist nur unter Voraussetzungen des Absatzes 3 möglich. Die Abmeldung kann schriftlich beim Prüfer oder per Online-Abmeldung beim Studienbüro erfolgen. Eine durch Widerruf abgemeldete Prüfung gilt als nicht angemeldet. Der Rücktritt von mündlichen Nachprüfungen im Sinne von § 8 Absatz 2 ist grundsätzlich nur unter den Voraussetzungen von Absatz 3 möglich.

(2) Eine Prüfung gilt als mit „nicht ausreichend" (5.0) bewertet, wenn der Studierende einen Prüfungstermin ohne triftigen Grund versäumt oder wenn er nach Beginn der Prüfung ohne triftigen Grund von der Prüfung zurücktritt. Dasselbe gilt, wenn die Bachelorarbeit nicht innerhalb der vorgesehenen Bearbeitungszeit erbracht wird, es sei denn, der Studierende hat die Fristüberschreitung nicht zu vertreten.

(3) Der für den Rücktritt nach Beginn der Prüfung oder das Versäumnis geltend gemachte Grund muss dem Prüfungsausschuss unverzüglich schriftlich angezeigt und glaubhaft gemacht

werden. Bei Krankheit des Studierenden oder eines von ihm allein zu versorgenden Kindes oder pflegebedürftigen Angehörigen kann die Vorlage eines ärztlichen Attests und in Zweifelsfällen ein amtsärztliches Attest verlangt werden. Die Anerkennung des Rücktritts ist ausgeschlossen, wenn bis zum Eintritt des Hinderungsgrundes bereits Prüfungsleistungen erbracht worden sind und nach deren Ergebnis die Prüfung nicht bestanden werden kann. Werden die Gründe anerkannt, wird ein neuer Termin anberaumt. Die bereits vorliegenden Prüfungsergebnisse sind in diesem Fall anzurechnen. Bei Modulprüfungen, die aus mehreren Prüfungen bestehen, werden die Prüfungsleistungen dieses Moduls, die bis zu einem anerkannten Rücktritt bzw. einem anerkannten Versäumnis einer Prüfungsleistung dieses Moduls erbracht worden sind, angerechnet.

(4) Versucht der Studierende, 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. Für Erfolgskontrollen anderer Art (§ 4 Abs. 2, Nr. 3) gilt dies entsprechend.

(5) Ein Studierender, der den ordnungsgemäßen Ablauf der Prüfung stört, kann von dem jeweiligen Prüfer oder der Aufsicht führenden Person von der Fortsetzung der Prüfung ausgeschlossen werden; in diesem Fall gilt die betreffende Prüfung als mit „nicht ausreichend" (5.0) bewertet. In schwerwiegenden Fällen kann der Prüfungsausschuss den Studierenden von der Erbringung weiterer Prüfungen ausschließen. Für Erfolgskontrollen anderer Art (§ 4 Abs. 2, Nr. 3) gilt dies entsprechend.

(6) Der Studierende kann innerhalb von einem Monat verlangen, dass die Entscheidung gemäß Absatz 4 und 5 vom Prüfungsausschuss überprüft wird. Belastende Entscheidungen des Prüfungsausschusses sind dem Studierenden unverzüglich schriftlich mitzuteilen, zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Vor einer Entscheidung ist dem Studierenden Gelegenheit zur Äußerung zu geben.

(7) Näheres regelt die Allgemeine Satzung der Universität Karlsruhe (TH) zur Redlichkeit bei Prüfungen und Praktika.

§ 10 Mutterschutz, Elternzeit, Wahrnehmung von Familienpflichten

(1) Auf Antrag sind die Mutterschutzfristen, wie sie im jeweils gültigen Gesetz zum Schutz der erwerbstätigen Mutter (MuSchG) festgelegt sind, entsprechend zu berücksichtigen. Dem Antrag sind die erforderlichen Nachweise beizufügen. Die Mutterschutzfristen unterbrechen jede Frist nach dieser Studien- und Prüfungsordnung. Die Dauer des Mutterschutzes wird nicht in die Frist eingerechnet.

(2) Gleichfalls sind die Fristen der Elternzeit nach Maßgabe des jeweiligen, gültigen Gesetzes (BErzGG) auf Antrag zu berücksichtigen. Der Studierende muss bis spätestens vier Wochen vor dem Zeitpunkt, von dem an er die Elternzeit antreten will, dem Prüfungsausschuss unter Beifügung der erforderlichen Nachweise schriftlich mitteilen, in welchem Zeitraum er Elternzeit in Anspruch nehmen will. Der Prüfungsausschuss hat zu prüfen, ob die gesetzlichen Voraussetzungen vorliegen, die bei einem Arbeitnehmer den Anspruch auf Elternzeit auslösen würden, und teilt dem Studierenden das Ergebnis sowie die neu festgesetzten Prüfungszeiten unverzüglich mit. Die Bearbeitungszeit der Bachelorarbeit kann nicht durch Elternzeit unterbrochen werden. Die gestellte Arbeit gilt als nicht vergeben. Nach Ablauf der Elternzeit erhält der Studierende ein neues Thema.

(3) Der Prüfungsausschuss entscheidet auf Antrag über die flexible Handhabung von Prüfungsfristen entsprechend den Bestimmungen des Landeshochschulgesetzes, wenn Studierende Familienpflichten wahrzunehmen haben. Die Bearbeitungszeit der Bachelorarbeit kann nicht durch die Wahrnehmung von Familienpflichten unterbrochen oder verlängert werden. Die gestellte Arbeit gilt als nicht vergeben. Der Studierende erhält ein neues Thema, das innerhalb der in § 11 festgelegten Bearbeitungszeit zu bearbeiten ist.

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§ 11 Bachelorarbeit

(1) Voraussetzung für die Zulassung zur Bachelorarbeit ist, dass der Studierende sich in der Regel im 3. Studienjahr befindet und nicht mehr als eine der Fachprüfungen laut § 17 Absatz 2 noch nicht bestanden wurde.

Vor Zulassung sind Betreuer, Thema und Anmeldedatum dem Prüfungsausschuss bekannt zu geben. Auf Antrag des Studierenden sorgt ausnahmsweise der Vorsitzende des Prüfungsausschusses dafür, dass der Studierende innerhalb von vier Wochen nach Antragstellung von einem Betreuer ein Thema für die Bachelorarbeit erhält. Die Ausgabe des Themas erfolgt in diesem Fall über den Vorsitzenden des Prüfungsausschusses.

(2) Thema, Aufgabenstellung und Umfang der Bachelorarbeit sind vom Betreuer so zu begrenzen, dass sie mit dem in Absatz 3 festgelegten Arbeitsaufwand bearbeitet werden kann.

(3) Die Bachelorarbeit soll zeigen, dass der Studierende in der Lage ist, ein Problem aus seinem Fach selbstständig und in begrenzter Zeit nach wissenschaftlichen Methoden zu bearbeiten. Der Bachelorarbeit werden 12 Leistungspunkte zugeordnet, der Arbeitsaufwand soll daher 360 Stunden nicht übersteigen. Die empfohlene Bearbeitungsdauer beträgt sechs Monate. Die maximale Bearbeitungsdauer beträgt einschließlich einer Verlängerung neun Monate. Die Bachelorarbeit kann auch auf Englisch geschrieben werden.

(4) Die Bachelorarbeit kann von jedem Prüfer nach § 15 Abs. 2 vergeben und betreut werden. Soll die Bachelorarbeit außerhalb der beiden nach § 1 Abs. 2 Satz 1 beteiligten Fakultäten angefertigt werden, so bedarf dies der Genehmigung des Prüfungsausschusses.

Dem Studierenden 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 des einzelnen Studierenden aufgrund objektiver Kriterien, die eine eindeutige Abgrenzung ermöglichen, deutlich unterscheidbar ist und die Anforderung nach Absatz 1 erfüllt.

(5) Bei der Abgabe der Bachelorarbeit hat der Studierende schriftlich zu versichern, dass er die Arbeit selbstständig verfasst hat und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt hat, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung der Universität Karlsruhe (TH) zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet hat. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Bei Abgabe einer unwahren Versicherung wird die Bachelorarbeit mit „nicht ausreichend" (5.0) bewertet.

(6) Der Zeitpunkt der Ausgabe des Themas der Bachelorarbeit und der Zeitpunkt der Abgabe der Bachelorarbeit sind beim Prüfungsausschuss aktenkundig zu machen. Der Studierende kann das Thema der Bachelorarbeit nur einmal und nur innerhalb der ersten zwei Monate der Bearbeitungszeit zurückgeben. Auf begründeten Antrag des Studierenden kann der Prüfungsausschuss die in Absatz 3 festgelegte Bearbeitungszeit um höchstens drei Monate verlängern. Wird die Bachelorarbeit nicht fristgerecht abgeliefert, gilt sie als mit „nicht ausreichend" bewertet, es sei denn, dass der Studierende dieses Versäumnis nicht zu vertreten hat. § 8 gilt entsprechend.

(7) Die Bachelorarbeit wird von einem Betreuer sowie in der Regel von einem weiteren Prüfer bewertet. Einer der beiden muss Juniorprofessor oder Professor sein. Bei nicht übereinstimmender Beurteilung der beiden Prüfer setzt der Prüfungsausschuss im Rahmen der Bewertung der beiden Prüfer die Note der Bachelorarbeit fest. Der Bewertungszeitraum soll sechs Wochen nicht überschreiten.

(8) Die Vorbereitung auf die Bachelorarbeit wird im Rahmen eines der verpflichtenden Seminare (nach § 17 Abs. 4) gewährleistet.

§ 12 Berufspraktikum

(1) Während des Bachelorstudiums ist ein mindestens sechswöchiges Berufspraktikum abzuleisten, welches geeignet ist, den Studierenden eine Anschauung von berufspraktischer Tätigkeit in Informationswirtschaft zu vermitteln. Dem Berufspraktikum sind 8 Leistungspunkte zugeordnet.

(2) Der Studierende setzt sich in eigener Verantwortung mit geeigneten privaten bzw. öffentlichen Einrichtungen in Verbindung, an denen das Praktikum abgeleistet werden kann. Der Studierende wird von einem Prüfer nach § 15 Abs. 2 und einem Firmenbetreuer betreut.

(3) Am Ende des Berufspraktikums ist dem Prüfer ein kurzer Bericht abzugeben und eine Kurzpräsentation der Erfahrungen im Berufspraktikum zu halten.

(4) Das Berufspraktikum ist abgeschlossen, wenn eine mindestens sechswöchige Tätigkeit nachgewiesen wird, der Bericht abgegeben und die Kurzpräsentation gehalten wurde. Die Durchführung des Berufspraktikums ist im Studienplan zu regeln. Das Berufspraktikum geht nicht in die Gesamtnote ein.

§ 13 Zusatzleistungen und Zusatzmodule

(1) Innerhalb der Regelstudienzeit, einschließlich der Urlaubssemester für das Studium an einer ausländischen Hochschule (Regelprüfungszeit), können in einem Modul bzw. Fach auch weitere Leistungspunkte (Zusatzleistungen) im Umfang von höchstens 20 Leistungspunkten erworben werden. § 3, § 4 und § 8 Abs. 10 der Studien- und Prüfungsordnung bleiben davon unberührt. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt-, Fach- und Modulnoten ein. Soweit Zusatzleistungen erbracht wurden, werden auf Antrag des Studierenden bei der Festlegung der Modul- bzw. Fachnote nur die Noten berücksichtigt, die unter Abdeckung der erforderlichen Leistungspunkte die beste Modul- bzw. Fachnote ergeben. Die bei der Festlegung der Modul- bzw. Fachnote nicht berücksichtigten Leistungspunkte werden als Zusatzleistungen automatisch im Transcript of Records aufgeführt und als Zusatzleistungen gekennzeichnet. Zusatzleistungen werden mit den nach § 7 vorgesehenen Noten gelistet.

(2) Der Studierende hat bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

(3) Die Ergebnisse maximal zweier Module, die jeweils mindestens 9 Leistungspunkte umfassen müssen, werden auf Antrag des Studierenden in das Bachelorzeugnis als Zusatzmodule aufgenommen und als solche gekennzeichnet. Zusatzmodule werden bei der Festsetzung der Gesamt-, Fach- und Modulnoten nicht mit einbezogen. Nicht in das Zeugnis aufgenommene Zusatzmodule werden im Transcript of Records automatisch aufgenommen und als Zusatzmodule gekennzeichnet. Zusatzmodule werden mit den nach § 7 vorgesehenen Noten gelistet.

(4) Neben den im Studienplan definierten fachwissenschaftlichen Modulen und Leistungen können die Zusatzleistungen nach Absatz 1 - 3 auch aus dem Lehrangebot anderer Fakultäten und Einrichtungen gewählt werden.

§ 14 Prüfungsausschuss

(1) Für den Bachelorstudiengang Informationswirtschaft wird ein Prüfungsausschuss gebildet. Er besteht aus sechs stimmberechtigten Mitgliedern, die jeweils zur Hälfte von der Fakultät für Informatik und der Fakultät für Wirtschaftswissenschaften bestellt werden: vier Professoren, Juniorprofessoren, Hochschul- oder Privatdozenten, zwei Vertretern der Gruppe der akademischen Mitarbeiter nach § 10 Abs. 1 Satz 2 Nr. 2 LHG und einem Vertreter der Studierenden mit beratender Stimme. Im Falle der Einrichtung eines gemeinsamen Prüfungsausschusses für den Bachelor- und den Masterstudiengang Informationswirtschaft erhöht sich die Anzahl der Vertreter der Studierenden auf zwei Mitglieder mit beratender Stimme, wobei je ein Vertreter aus dem Bachelor- und ein Vertreter aus dem Masterstudiengang stammt. Die Amtszeit der nichtstudentischen Mitglieder beträgt zwei Jahre, die des studentischen Mitglieds ein Jahr.

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(2) Der Vorsitzende, sein Stellvertreter, die weiteren Mitglieder des Prüfungsausschusses sowie deren Stellvertreter werden von den jeweiligen Fakultätsräten bestellt, die Mitglieder der Gruppe der akademischen Mitarbeiter nach § 10 Abs. 1 Satz 2 Nr. 2 LHG und der Vertreter der Studierenden auf Vorschlag der Mitglieder der jeweiligen Gruppe; Wiederbestellung ist möglich. Der Vorsitzende und dessen Stellvertreter müssen Professor oder Juniorprofessor aus einer der beteiligten Fakultäten sein. Der Vorsitz wechselt zwischen den Fakultäten alle zwei Jahre. Der Vorsitzende des Prüfungsausschusses nimmt die laufenden Geschäfte wahr und wird durch die Prüfungssekretariate unterstützt.

(3) Der Prüfungsausschuss regelt die Auslegung und die Umsetzung der Studien- und Prüfungsordnung in die Prüfungspraxis der Fakultäten. Er achtet darauf, dass die Bestimmungen der Studien- und Prüfungsordnung eingehalten werden. Er entscheidet über die Anrechnung von Studienzeiten, Studienleistungen und Modulprüfungen und übernimmt die Gleichwertigkeitsfeststellung. 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 Studien- und Prüfungsordnung.

(4) Der Prüfungsausschuss kann die Erledigung seiner Aufgaben in dringenden Angelegenheiten und für alle Regelfälle auf den Vorsitzenden des Prüfungsausschusses übertragen.

(5) Die Mitglieder des Prüfungsausschusses haben das Recht, der Abnahme von Prüfungen beizuwohnen. Die Mitglieder des Prüfungsausschusses, die Prüfer und die Beisitzenden unterliegen der Amtsverschwiegenheit. Sofern sie nicht im öffentlichen Dienst stehen, sind sie durch den Vorsitzenden zur Verschwiegenheit zu verpflichten.

(6) In Angelegenheiten des Prüfungsausschusses, die eine an einer anderen Fakultät zu absolvierende Prüfungsleistung betreffen, ist auf Antrag eines Mitgliedes des Prüfungsausschusses ein fachlich zuständiger und von der betroffenen Fakultät zu nennender Professor, Juniorprofessor, Hochschul- oder Privatdozent hinzuziehen. Er hat in diesem Punkt Stimmrecht.

(7) Belastende Entscheidungen des Prüfungsausschusses sind schriftlich mitzuteilen. Sie sind zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Widersprüche gegen Entscheidungen des Prüfungsausschusses sind innerhalb eines Monats nach Zugang der Entscheidung schriftlich oder zur Niederschrift beim Rektorat der Universität Karlsruhe (TH) einzulegen.

§ 15 Prüfer und Beisitzer

(1) Der Prüfungsausschuss bestellt die Prüfer und die Beisitzenden. Er kann die Bestellung dem Vorsitzenden übertragen.

(2) Prüfer sind Hochschullehrer und habilitierte Mitglieder sowie akademische Mitarbeiter der jeweiligen Fakultät, denen die Prüfungsbefugnis übertragen wurde. Bestellt werden darf nur, wer mindestens die dem jeweiligen Prüfungsgegenstand entsprechende fachwissenschaftliche Qualifikation erworben hat. Bei der Bewertung der Bachelorarbeit muss ein Prüfer Hochschullehrer sein.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zum Prüfer bestellt werden, wenn die jeweilige Fakultät ihnen 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.

§ 16 Anrechnung von Studienzeiten, Anerkennung von Studien- und Prüfungsleistungen

(1) Studienzeiten im gleichen Studiengang werden angerechnet. Studien- und Prüfungsleistungen, die in gleichen oder anderen Studiengängen an der Universität Karlsruhe (TH) oder an anderen Hochschulen erbracht wurden, werden angerechnet, soweit Gleichwertigkeit besteht. Gleichwertigkeit ist festzustellen, wenn Leistungen in Inhalt, Umfang und in den Anforderungen

denjenigen des Studiengangs im Wesentlichen entsprechen. Dabei ist kein schematischer Vergleich, sondern eine Gesamtbetrachtung vorzunehmen. Bezüglich des Umfangs einer zur Anerkennung vorgelegten Studien- und Prüfungsleistung werden die Grundsätze des ECTS herangezogen; die inhaltliche Gleichwertigkeitsprüfung orientiert sich an den Qualifikationszielen des Moduls.

(2) Werden Leistungen angerechnet, können die Noten – soweit die Notensysteme vergleichbar sind – übernommen werden und in die Berechnung der Modulnoten und der Gesamtnote einbezogen werden. Liegen keine Noten vor, muss die Leistung nicht anerkannt werden. Der Studierende hat die für die Anrechnung erforderlichen Unterlagen vorzulegen.

(3) Bei der Anrechnung von Studienzeiten und der Anerkennung von Studien- und Prüfungsleistungen, die außerhalb der Bundesrepublik erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(4) Absatz 1 gilt auch für Studienzeiten, Studien- und Prüfungsleistungen, die in staatlich anerkannten Fernstudien- und an anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufsakademien sowie an Fach- und Ingenieurschulen erworben wurden.

(5) Die Anerkennung von Teilen der Bachelorprüfung kann versagt werden, wenn in einem Studiengang mehr als 80 Leistungspunkte und/oder die Bachelorarbeit anerkannt werden soll/en. Dies gilt insbesondere bei einem Studiengangwechsel sowie bei einem Studienortwechsel.

(6) Zuständig für die Anrechnungen ist der Prüfungsausschuss. Vor Feststellungen über die Gleichwertigkeit sind die zuständigen Fachvertreter zu hören. Der Prüfungsausschuss entscheidet in Abhängigkeit von Art und Umfang der anzurechnenden Studien- und Prüfungsleistungen über die Einstufung in ein höheres Fachsemester.

(7) Erbringt ein Studierender Studienleistungen an einer ausländischen Universität, soll die Gleichwertigkeit vorab durch einen Studienvertrag nach den ECTS-Richtlinien festgestellt und nach diesem verfahren werden.

II. Bachelorprüfung

§ 17 Umfang und Art der Bachelorprüfung

(1) Die Bachelorprüfung besteht aus den Fachprüfungen nach Absatz 2 - 4 sowie der Bachelorarbeit (§ 11).

(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 16 Leistungspunkten,

2. Volkswirtschaftslehre im Umfang von 5 Leistungspunkten,

3. Informatik im Umfang von 37 Leistungspunkten,

4. Mathematik im Umfang von 16 Leistungspunkten,

5. Operations Research im Umfang von 9 Leistungspunkten,

6. Statistik im Umfang von 10 Leistungspunkten,

7. Recht im Umfang von 19 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 § 5 erfüllt.

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(3) Im dritten Studienjahr sind Fachprüfungen

1. aus dem Fach Informatik durch Module im Umfang von 18 Leistungspunkten,

2. aus wirtschaftswissenschaftlichen Fächern durch Module im Umfang von 18 Leistungspunkten sowie

3. aus dem Fach Recht durch Module im Umfang von 6 Leistungspunkten

abzulegen. Wirtschaftswissenschaftliche Fächer sind Betriebswirtschaftslehre, Operations Research und Volkswirtschaftslehre. Dabei sind im Fach Betriebswirtschaftslehre mindestens 9 Leistungspunkte abzulegen. Die Module, die ihnen zugeordneten Leistungspunkte und die Zuordnung der Module und Seminare zu den Fächern sind im Studienplan festgelegt.

(4) Ferner ist im dritten Studienjahr in zwei unterschiedlichen Fächern jeweils ein Seminar im Umfang von je 3 Leistungspunkten zu absolvieren. Das Seminar wird dabei in die Fachnote des Faches eingerechnet, dem das Seminar zugeordnet ist. Die Zuordnung der Seminare zu den Fächern ist im Studienplan festgelegt.

(5) Im dritten Studienjahr ist als eine weitere Prüfungsleistung eine Bachelorarbeit gemäß § 11 anzufertigen.

§ 18 Nachweise für die Bachelorprüfung

Voraussetzung für die Anmeldung zur letzten Modulprüfung der Bachelorprüfung ist die Bescheinigung über das erfolgreich abgeleistete Berufspraktikum nach § 12. In Ausnahmefällen, die der Studierende nicht zu vertreten hat, kann der Prüfungsausschuss die nachträgliche Vorlage dieses Nachweises 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 4) und der Bachelorarbeit doppelt gewichtet.

(3) Hat der Studierende die Bachelorarbeit mit der Note 1.0 und die Bachelorprüfung mit einer Gesamtnote von 1.2 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung" (with distinction) verliehen.

§ 20 Bachelorzeugnis, Bachelorurkunde, Transcript of Records und Diploma Supplement

(1) Über die Bachelorprüfung werden nach Bewertung der letzten Prüfungsleistung eine Bachelorurkunde und ein Zeugnis erstellt. Die Ausfertigung von Bachelorurkunde und Zeugnis soll nicht später als sechs Wochen nach der Bewertung der letzten Prüfungsleistung erfolgen. Bachelorurkunde und Bachelorzeugnis werden in deutscher und englischer Sprache ausgestellt. Bachelorurkunde und Zeugnis tragen das Datum der letzten erfolgreich nachgewiesenen Prüfungsleistung. Sie werden dem Studierenden gleichzeitig ausgehändigt. In der Bachelorurkunde wird die Verleihung des akademischen Bachelorgrades beurkundet. Die Bachelorurkunde wird vom Rektor und den Dekanen der beteiligten Fakultäten unterzeichnet und mit dem Siegel der Universität versehen.

(2) Das Zeugnis enthält die in den Fachprüfungen, den zugeordneten Modulprüfungen und der Bachelorarbeit erzielten Noten, deren zugeordnete Leistungspunkte und ECTS-Noten und die Gesamtnote und die ihr entsprechende ECTS-Note. Das Zeugnis ist von den Dekanen der beteiligten Fakultäten und vom Vorsitzenden des Prüfungsausschusses zu unterzeichnen.

(3) Weiterhin erhält der Studierende als Anhang ein Diploma Supplement in deutscher und englischer Sprache, das den Vorgaben des jeweils gültigen ECTS User's Guide entspricht. Das

Diploma Supplement enthält eine Abschrift der Studiendaten des Studierenden (Transcript of Records).

(4) Die Abschrift der Studiendaten (Transcript of Records) enthält in strukturierter Form alle vom Studierenden erbrachten Prüfungsleistungen. Dies beinhaltet alle Fächer, Fachnoten und ihre entsprechende ECTS-Note samt den zugeordneten Leistungspunkten, die dem jeweiligen Fach zugeordneten Module mit den Modulnoten, entsprechender ECTS-Note und zugeordneten Leistungspunkten sowie die den Modulen zugeordneten Lehrveranstaltungen samt Noten und zugeordneten Leistungspunkten. Aus der Abschrift der Studiendaten sollen die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen und die Zugehörigkeit der Module zu den einzelnen Fächern deutlich erkennbar sein. Angerechnete Studienleistungen sind im Transcript of Records aufzunehmen.

(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 dem Studierenden durch den Prüfungsausschuss in schriftlicher Form erteilt. Der Bescheid ist mit einer Rechtsbehelfsbelehrung zu versehen.

(2) Hat der Studierende die Bachelorprüfung endgültig nicht bestanden, wird ihm auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Prüfungsleistungen und deren Noten enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 22 Ungültigkeit der Bachelorprüfung, Aberkennung des Bachelorgrades

(1) Hat der Studierende 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 der Studierende 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 der Studierende darüber täuschen wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat der Studierende die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend" (5.0) und die Bachelorprüfung für „nicht bestanden" erklärt werden.

(3) Dem Studierenden ist vor einer Entscheidung nach Absatz 1 und Absatz 2 Satz 2 Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Dies bezieht sich auch auf alle davon betroffenen Anlagen (Transcript of Records und Diploma Supplement). Mit dem unrichtigen Zeugnis ist auch die Bachelorurkunde und alle Anlagen (Transcript of Records und Diploma Supplement) einzuziehen, wenn die Prüfung aufgrund einer Täuschung für „nicht bestanden" erklärt wurde.

(5) Eine Entscheidung nach Absatz 1 oder Absatz 2 Satz 2 ist nach einer Frist von fünf Jahren ab dem Datum des Prüfungszeugnisses ausgeschlossen.

(6) Die Aberkennung des akademischen Bachelorgrades richtet sich nach den gesetzlichen Bestimmungen.

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§ 23 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Bachelorprüfung wird dem Studierenden auf Antrag innerhalb eines Jahres Einsicht in seine Bachelorarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.

(2) Für die Einsichtnahme in die schriftlichen Modulprüfungen, schriftlichen Modulteilprüfungen bzw. Prüfungsprotokolle gilt eine Frist von einem Monat nach Bekanntgabe des Prüfungsergebnisses.

(3) Der Prüfer bestimmt Ort und Zeit der Einsichtnahme.

(4) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.

§ 24 In-Kraft-Treten

(1) Diese Satzung tritt am 1. Oktober 2009 in Kraft.

(2) Studierende, die ihr Studium an der Universität Karlsruhe (TH) auf Grundlage der Prüfungsordnung für den Bachelorstudiengang Informationswirtschaft vom 12. August 2005 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 29 vom 14. Oktober 2005) in der Fassung der Neubekanntmachung vom 15. August 2008 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 65 vom 18. August 2008) aufgenommen haben, können einen Antrag auf Zulassung zur Prüfung letztmalig am 30. September 2013 stellen.

(3) Auf Antrag können Studierende, die ihr Studium an der Universität Karlsruhe (TH) auf Grundlage der Prüfungsordnung für den Bachelorstudiengang Informationswirtschaft vom 12. August 2005 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 29 vom 14. Oktober 2005) in der Fassung der Neubekanntmachung vom 15. August 2008 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 65 vom 18. August 2008) begonnen haben, ihr Studium nach der vorliegenden Prüfungsordnung fortsetzen. Der Prüfungsausschuss stellt dabei fest, ob und wie die bisher erbrachten Prüfungsleistungen in den neuen Studienplan integriert werden können und nach welchen Bedingungen das Studium nach einem Wechsel fortgeführt werden kann.

Karlsruhe, den 15. April 2009

Professor Dr. sc. tech. Horst Hippler
(Rektor)

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