

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

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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.

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

Semester	Specialization Programme						
Subject	INFO		BA/EC/OR/STAT			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..

Abbildung 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	SWS	CP
1st Term			
IW1WWBWL	Financial and Management Accounting	2/2	4.0
IW1WWVWL	Economics I	3/0/2	5.0
IW1MAMATH	Mathematics I	4/2/2	8.0
IW1ININF1	Fundamental terms in Informatics	2/1/2	5.0
IW1ININF1	Programming	2/0/2	5.0
IW1INJURA	Civil Law for Beginners	4/0	4.0
			31.0
2nd Term			
IW1WWBWL	Introduction to Information Engineering and Management	2/2	4.0
IW1WWSTAT	Statistics I	3/2/2	5.0
IW1WWOR	Introduction to Operations Research I	2/0/2	4.5
IW1MAMATH	Mathematics II	4/2/2	8.0
IW1ININF2	Informatics II	4/2/2	6.0
IW1INJURA	Advanced Civil Law	2/0	3.0
			30.5
3rd Term			
IW1WWBWL	Basics of Business Administration C	2/0/2	4.0
IW1WWSTAT	Statistics II	3/2/2	5.0
IW1WWOR	Introduction to Operations Research II	2/2/2	4.5
IW1ININF3	Informatics III	4/2	7.0
IW1WWAINF	Applied Informatics I	2/1	4.0
IW1INJURA	Commercial and Corporate Law	2/0	3.0
IW1INJURA	Public Law I	2/0	3.0
			30.5
4th Term			
IW1WWBWL	Basics of Business Administration B	2/1	4.0
IW1WWAINF	Applied Informatics II	2/2/2	4.0
IW1INTINF	Computer Engineering II	3/1/2	6.0
IW1INJURA	Public Law II	2/0	3.0
IW1INJURA	Exercises in Civil Law	0/2	3.0
IW1EXPRAK	Internship		8.0
			28.0
			120.0

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

Begin and completion of a module

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

General exams and partial exams

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

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

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

Repeating exams

Principally, a failed exam can be repeated only once. If the **repeat examination** (including an eventually provided verbal repeat examination) will be failed as well, the **examination claim** is lost. 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 losing the examination claim. A counseling interview is mandatory. For further information see <http://www.wiwi.uni-karlsruhe.de/studium/hinweise/>.

Bonus accomplishments and additional accomplishments

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

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student

and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Up to 2 modules with a minimum of 9 CP may appear additionally in the certificate. After the approval of the examination committee, it is also possible to include modules in the certificate, which are not defined in the module handbook. Single additional courses will be recorded in the transcript of records. Courses and modules, which have been declared as bonus accomplishments, can be changed to additional accomplishments.

Further information

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

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	exercise course	Übung
V	lecture	Vorlesung
W	winter term	Wintersemester

3 Modules of term 1-4

3.1 Informatics

Module: Foundations in Informatics

Module key: [IW1INF1]

Subject: Informatics

Module coordination: Gregor Snelting

Credit points (CP): 10

Learning Control / Examinations

The assessment of this module consists of

1. Completion of *Grundbegriffe der Informatik* [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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

Content

Courses in module *Foundations in Informatics* [IW1INF1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24001	Grundbegriffe der Informatik (S. 81)	2/1/2	W	5	Worsch
24004	Programming (S. 82)	2/0/2	W	5	Snelting

Module: Algorithms I**Module key: [IW2INF2]****Subject:** Informatics**Module coordination:** Peter Sanders**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Algorithms I* [IW2INF2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24500	Algorithms I (S. 83)	3/1/2	S	6	Sanders

Module: Theoretical Informatics**Module key: [IW2INF3]****Subject:** Informatics**Module coordination:** Jörn Müller-Quade**Credit points (CP):** 7**Learning Control / Examinations**

The assessment of the module consists of a grade certificate for the exercise according to §4(2), 3 of the examination regulation and of a written examination according to §4(2), 1 of the examination regulation.

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Theoretical Informatics* [IW2INF3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
theogrundinfo	Theoretische Grundlagen der Informatik (S. 84)	3/1	W	7	Müller-Quade

Module: Computer Engineering**Module key: [IW2INF4]****Subject:** Informatics**Module coordination:** Wolfgang Karl**Credit points (CP):** 6**Learning Control / Examinations**

The assessment is a written examination (60 minutes) according to §4(2), 1 of the examination regulation.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Computer Engineering* [IW2INF4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24502	Rechnerorganisation (S. 85)	3/1/2	S	6	Asfour, Dillmann, Henkel, Karl

Module: Applied Informatics**Module key: [IW1INF5]****Subject:** Informatics**Module coordination:** Andreas Oberweis, Stefan Tai**Credit points (CP):** 8**Learning Control / Examinations**

The assessments of the Applied Informatics I [25070] and Applied Informatics II [25033] are written examinations (60 min each) according to §4(2), 1 SPO.

The grade of the module is the average of the grade of the assessment of the course 25070 and of the grade of 25033.

Prerequisites

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

Conditions

None.

Learning Outcomes

The student should:

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

Content

The course *Applied Informatics I* [25070] mainly addresses the early phases of the development of database-supported information systems, distributed systems for information services, intelligent systems and software systems in general. Main topics are modelling concepts and languages for describing application domains as well as static and dynamic aspects of early software system design. The course addresses in detail the following approaches: Entity-Relationship model, advanced aspects of UML, description logic, relational model, Petri nets, and event-driven process chains.

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

Courses in module *Applied Informatics* [IW1INF5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25070	Applied Informatics I - Modelling (S. 86)	2/1	W	4	Oberweis, Studer, Agarwal Tai
25033	Applied Informatics II - IT Systems for e-Commerce (S. 87)	2/1	S	4	

3.2 Business Administration

Module: Foundations in Business Administration

Module key: [IW1BWL1]

Subject: Business Administration

Module coordination: Christof Weinhardt, Marliese Uhrig-Homburg

Credit points (CP): 8

Learning Control / Examinations

The assessment of the course *Financial Accounting and Cost Accounting* is a written examination according to §4 Abs. 2 Nr. 1 SPO.

The assessment of the course *Introduction to Information Engineering and Management* is a written examination according to §4 Abs. 2 Nr. 1 SPO.

The grade of the module is the average of the grades of the assessments of the courses *Introduction to Information Engineering*, weighted by their credit points and rounded after the first decimal place.

Prerequisites

None.

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.

Courses in module *Foundations in Business Administration* [IW1BWL1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25002/25003 26490	Financial Accounting and Cost Accounting (S. 88)	2/2	W	4	Burdelski
	Introduction to Information Engineering and Management (S. 89)	2/2	S	4	Weinhardt, Geyer-Schulz

Module: Business Administration

Module key: [IW1BWL2]

Subject: Business Administration

Module coordination: Christof Weinhardt, Marliese Uhrig-Homburg

Credit points (CP): 8

Learning Control / Examinations

Prerequisites

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

Conditions

None.

Learning Outcomes

The student should be able to

- formulate, assess and choose 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 design of contracts
- know the notions, functions, areas and tools of controlling
- describe the impacts and features of marketing instruments
- know 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 assess 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.

Courses in module *Business Administration* [IW1BWL2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25026/25027	Business Administration and Management Science C (S. 92)	2/0/2	W	4	Lindstädt, Ruckes, Uhrig-Homburg, Burdelski
25024/25025	Business Administration and Management Science B (S. 91)	2/0/2	S	4	Gaul, Lützkendorf, Geyer-Schulz, Weinhardt, Burdelski

3.3 Economics

Module: Economics

Module key: [IW1VWL]

Subject: Economics

Module coordination: Siegfried Berninghaus, Clemens Puppe

Credit points (CP): 5

Learning Control / Examinations

The assessment of the module is a written examination according to §4(2), 1 of the examination regulation.

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

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

In particular, the student should learn

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

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

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

Content

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

Courses in module *Economics* [IW1VWL]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25512	Economics I: Microeconomics (S. 95)	3/0/2	W	5	Berninghaus

Remarks

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

3.4 Operations Research

Module: Introduction to Operations Research

Module key: [IW1OR]

Subject: Operations Research

Module coordination: Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann

Credit points (CP): 9

Learning Control / Examinations

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

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

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

Prerequisites

Mathematics I und II. Programming knowledge for computing exercises.

Conditions

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

Learning Outcomes

The student

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

Content

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

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

Courses in module *Introduction to Operations Research* [IW1OR]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25040	Introduction to Operations Research I (S. 93)	2/2/2	S	4.5	Nickel, Stein, Waldmann
25043	Introduction to Operations Research II (S. 94)	2/2/2	W	4.5	Nickel, Stein, Waldmann

3.5 Statistics

Module: Statistics

Module key: [IW1STAT]

Subject: Statistics

Module coordination: Svetlozar Rachev, Markus Höchstötter

Credit points (CP): 10

Learning Control / Examinations

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

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

Prerequisites

None.

Conditions

It is recommended to attend the course *Statistics I* [25008/25009] before the course *Statistics II* [25020/25021].

Each course is complemented by an exercise, a tutorial and a computing laboratory. It is highly recommended to attend these too.

Learning Outcomes

Content

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate and bivariate analysis

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

C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method), interval estimations, theory of tests (optimality, most important examples of tests)

Courses in module *Statistics* [IW1STAT]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25008/25009	Statistics I (S. 96)	4/0/2	S	5	Höchstötter
25020/25021	Statistics II (S. 97)	4/0/2	W	5	Höchstötter

3.6 Law

Module: Introduction to Civil Law

Module key: [IW1JURA1]

Subject: Law

Module coordination: Thomas Dreier

Credit points (CP): 4

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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

The student

Content

The module generally 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 basics of jurisdiction, international conflicts and alternative dispute settlement will be discussed. The main focus of the course is on the fundamental notions of civil law as defined and regulated in the German Civil Code (Bürgerliches Gesetzbuch, BGB), such as subjects and objects of law, legally binding declarations, agency, the formation of contracts, standard terms and conditions, consumer protection, performance of contractual promises. The course ends with an outlook to the law of contracts and property law.

Courses in module *Introduction to Civil Law* [IW1JURA1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24012	Civil Law for Beginners (S. 98)	4/0	W	4	Dreier, Sester

Module: Commercial Law**Module key: [IW1JURA2]****Subject:** Law**Module coordination:** Peter Sester**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of this module consists of a written examination according to § 4(2), 1 of the examination regulation for the courses Civil Law for Beginners, Advanced Civil Law, and Commercial and Corporation Law.

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Commercial Law* [IW1JURA2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24504	Advanced Civil Law (S. 99)	2/0	S	3	Dreier, Sester
24011	Commercial and Corporate Law (S. 100)	2/0	W	3	Sester
24506/24017	Exercises in Civil Law (S. 101)	2/0	W/S	3	Sester, Dreier

Module: Constitutional and Administrative Law**Module key: [IW1JURA3]****Subject:** Law**Module coordination:** Indra Spiecker genannt Döhmann**Credit points (CP):** 6**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.

Prerequisites

None.

Conditions

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

Learning Outcomes**Content****Courses in module *Constitutional and Administrative Law* [IW1JURA3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24016	Public Law I - Basic Principles (S. 102)	2/0	W	3	Spiecker genannt Döhmann
24520	Public Law II - Public Economic Law (S. 103)	2/0	S	3	Spiecker genannt Döhmann

3.7 Mathematics

Module: Mathematics I

Module key: [IW1MATH1]

Subject: Mathematics

Module coordination: Christian Wieners

Credit points (CP): 8

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 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 examination has a weight of 80% and the certificate a weight of 20%.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

The students learn

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

The provides the foundations for

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

Content

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

Courses in module *Mathematics I* [IW1MATH1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
01360	Mathematics I for Information Engineering and Management (S. 104)	4/2/2	W	8	Rieder, Wieners, Neuss

Remarks

None.

Module: Mathematics II**Module key: [IW1MATH2]****Subject:** Mathematics**Module coordination:** Christian Wieners**Credit points (CP):** 8**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 examination has a weight of 80% and the certificate a weight of 20%.

PrerequisitesSuccessful conclusion of the module *Mathematics I*.**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.

Courses in module *Mathematics II* [IW1MATH2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
01877	Mathematics II for Information Engineering and Management (S. 105)	4/2/2	S	8	Rieder, Wieners, Neuss

3.8 General Modules

Module: Internship

Module key: [IW1EXPRAK]

Subject: nicht kategorisiert

Module coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften)

Credit points (CP): 8

Learning Control / Examinations

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

Prerequisites

None.

Conditions

The internship is regulated in §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

Content

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

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

1. Choice of the examiner and of the company or organization by the student.

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

2. Internship

The student passes the internship in the chosen company or organization.

3. Preparation of a short report and presentation:

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

4. Presentation and proof of performance.

The short presentation may be given in the form of a talk with the examiner, in a colloquium or in a seminar. The form is fixed at the registration of the internship with the examiner. The certificate of employment of the company and the short report must be delivered at the examiner *before* the presentation. Based on these, a certificate of performance is 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.

4 Modules of term 5-6

4.1 General Modules

Module: Seminar Module Informatics

Module key: [IW3SEMINFO]

Subject: Informatics (Specialization)

Module coordination: Martina Zitterbart

Credit points (CP): 3

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.

Prerequisites

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

Conditions

see german version

Learning Outcomes

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.

Courses in module Seminar Module Informatics [IW3SEMINFO]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079s	Seminar in Algorithm Design (S. 114)	2	W/S	3	Wagner
24073s	Seminar „Selected Topics in Software Engineering“ (S. 109)	2	W/S	3	Tichy
24074s	Seminar in Telematics (S. 111)	2	W/S	4	Zitterbart, Hartenstein
SemAIFB1	Seminar in Enterprise Information Systems (S. 233)	2	W/S	3	Studer, Oberweis, Stucky, Wolf, Kneuper
xIDLs	Seminar Information Services in Networks (S. 244)	2	W/S	3	Schmeck, Tai, Juling, Studer, Hartenstein, Tichy
SemAIFB4	Seminar Knowledge Management (S. 234)	2	W	3	Studer

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**Module key: [IW3SEMWIWI]****Subject:** Business Administration (Specialization), Economics (Specialization), OR (Specialization)**Module coordination:** Studiendekan (Fak. f. Wirtschaftswissenschaften)**Credit points (CP):** 3**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.

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

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.

Courses in module Seminar Module Economic Sciences [IW3SEMWIWI]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26524	Bachelor Seminar in Information Engineering and Management (S. 218)	2	W/S	3	Geyer-Schulz
SemIW	Seminar Information Engineering and Management (S. 236)	2	W/S	3,5	Weinhardt
26580	Seminar in Financial Engineering (S. 222)	2	W	3	Uhrig-Homburg
25916	Seminar: Management and Organization (S. 193)	2	W	3	Lindstädt
25915	Seminar: Management and Organization (S. 192)	2	S	3	Lindstädt
SemIIP2	Seminar in Industrial Production (S. 235)	2	W/S	3	Schultmann, Fröhling, Hiete
SemWIOR3	Seminar in Experimental Economics (S. 237)	2	W/S	3	Berninghaus
SemWIOR4	Seminar in Game and Decision Theory (S. 238)	2	W/S	3	Berninghaus
25191	Bachelor Seminar in Foundations of Marketing (S. 148)	2/0	W/S	3	Gaul

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 preceding semester.

Module: Seminar Module Law**Module key: [IW3SEMJURA]****Subject:** Law (Specialization)**Module coordination:** Thomas Dreier**Credit points (CP):** 3**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.

PrerequisitesFrom 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.**Conditions**

None.

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.

Courses in module *Seminar Module Law* [IW3SEMJURA]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
rechtsem	Seminar in Law (S. 240)	2	W/S	3	Dreier, Sester, Spiecker genannt Döhmann

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**Module key: [IW3THESIS]**

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

Credit points (CP): 12

Learning Control / Examinations

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

Prerequisites

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

Conditions

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

4.2 Business Administration

Module: eBusiness and Servicemanagement

Module key: [IW3BWLISM1]

Subject: Business Administration (Specialization)

Module coordination: Christof Weinhardt

Credit points (CP): 9

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 separately.

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

Prerequisites

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

Conditions

Keine.

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

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

The theoretic fundamentals of Information Engineering and Management can be enriched by a practical experience in Special Topics on Information Engineering and Management.

Courses in module eBusiness and Servicemanagement [IW3BWLISM1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26466	eServices (S. 212)	2/1	S	5	Weinhardt, Satzger
26452	Management of Business Networks (S. 210)	2/1	W	4.5	Weinhardt, Kraemer
26454	eFinance: Information Engineering and Management for Securities Trading (S. 211)	2/1	W	4.5	Weinhardt, Riordan
26478	Special Topics in Information Engineering & Management (S. 213)	3	W/S	4.5	Weinhardt

Module: Supply Chain Management**Module key: [IW3BWLISM2]****Subject:** Business Administration (Specialization)**Module coordination:** Christof Weinhardt**Credit points (CP):** 9**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 separately.

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

Prerequisites

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

Conditions

The lecture *Management of Business Networks* has to be attended.

Learning Outcomes

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

Content

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

Courses in module Supply Chain Management [IW3BWLISM2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26452	Management of Business Networks (S. 210)	2/1	W	4.5	Weinhardt, Kraemer
21078	Logistics (S. 106)	3/1	S	6	Furmans
25486	Facility Location and Strategic Supply Chain Management (S. 161)	2/1	S	4.5	Nickel

Remarks

Beginning from the winter term 2009/10 the lecture *Facility Location and Strategic Supply Chain Management* [25486] is first offered within the module.

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the <http://www.im.uni-karlsruhe.de/lehre>

Module: eFinance**Module key: [IW3BWLISM3]****Subject:** Business Administration (Specialization)**Module coordination:** Christof Weinhardt**Credit points (CP):** 9**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 separately.

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

Prerequisites

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

Conditions

The course *eFinance: Information Engineering and Management for Securities Trading* [26454] has to be attended.

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 addition the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a supplementary understanding for capital markets.

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

Courses in module eFinance [IW3BWLISM3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26454	eFinance: Information Engineering and Management for Securities Trading (S. 211)	2/1	W	4.5	Weinhardt, Riordan
25762	Intelligent Systems in Finance (S. 183)	2/1	S	5	Seese
26550	Derivatives (S. 219)	2/1	S	4.5	Uhrig-Homburg
25296	Exchanges (S. 152)	1	S	1.5	Franke
26570	International Finance (S. 220)	2	S	3	Uhrig-Homburg, Walter

Remarks

The lectures *Derivatives*, *Exchanges* and *International Finance* will first be offered in this module in the winter term 2009.

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the <http://www.im.uni-karlsruhe.de/lehre>

Module: CRM and Service Management**Module key: [IW3BWLISM4]****Subject:** Business Administration (Specialization)**Module coordination:** Andreas Geyer-Schulz**Credit points (CP):** 9**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. Thereby every lecture is examined by a written exam (according to Section 4(2), 1 of the examination regulation) and by successful 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 separately.

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

Prerequisites

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

Conditions

None.

Learning Outcomes

The student

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

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

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

Courses in module CRM and Service Management [IW3BWLISM4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26508	Customer Relationship Management (S. 214)	2/1	W	4,5	Geyer-Schulz
26522	Analytical CRM (S. 217)	2/1	S	4,5	Geyer-Schulz
26520	Operative CRM (S. 215)	2/1	W	4,5	Geyer-Schulz

Remarks

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

Module: Specialization in Customer Relationship Management Module key: [IW3BWLISM5]

Subject: Business Administration (Specialization)

Module coordination: Andreas Geyer-Schulz

Credit points (CP): 9

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 separately.

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

Prerequisites

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

Conditions

This module has to be taken together with the module *Customer Relationship Management and Servicemanagement* [WW3BWLCRM1].

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, analysis methods and techniques for the management and improvement of customer relations are presented. Furthermore, modelling, implementation, introduction, change, analysis and valuation of operative CRM processes are treated.

Regarding the first part, we teach analysis methods and techniques suitable for the management and improvement of customer relations. For this goal we treat the principles of customer- and service-oriented management as the foundation of successful customer relationship management. In addition, we show how knowledge of the customer can be used for decision-making at an aggregate level (e.g. planning of assortments, analysis of customer loyalty, ...). A basic requirement for this is the integration and collection of data from operative processes in a suitably defined data-warehouse in which all relevant data is kept for future analysis. The process of transferring data from the operative systems into the data warehouse is known as the ETL process (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.

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

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

Courses in module *Specialization in Customer Relationship Management* [IW3BWLISM5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26522	Analytical CRM (S. 217)	2/1	S	4,5	Geyer-Schulz
26520	Operative CRM (S. 215)	2/1	W	4,5	Geyer-Schulz
25158	Corporate Planning and Operations Research (S. 146)	2/1	W	4,5	Gaul
26240	Competition in Networks (S. 200)	2/1	W	5	Mitusch
26466	eServices (S. 212)	2/1	S	5	Weinhardt, Satzger

Module: Essentials of Finance**Module key: [IW3BWLFBV1]****Subject:** Business Administration (Specialization)**Module coordination:** Marliese Uhrig-Homburg, Martin E. Ruckes**Credit points (CP):** 9**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 separately.

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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.

Courses in module *Essentials of Finance* [IW3BWLFBV1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26575	Investments (S. 221)	2/1	S	4.5	Uhrig-Homburg
25216	Financial Management (S. 150)	2/1	S	4.5	Ruckes

Module: Topics in Finance I**Module key: [IW3BWLFBV5]****Subject:** Business Administration (Specialization)**Module coordination:** Marliese Uhrig-Homburg, Martin E. Ruckes**Credit points (CP):** 9**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. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

Prerequisites

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

Conditions

It is only possible to choose this module in combination with the module *Essentials in Finance* [IW3BWLFBV1].

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.

Courses in module *Topics in Finance I* [IW3BWLFBV5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25210	Management Accounting (S. 149)	2/1	S	4.5	Lüdecke
25232	Financial Intermediation (S. 151)	3	W	4.5	Ruckes
26550	Derivatives (S. 219)	2/1	S	4.5	Uhrig-Homburg
25296	Exchanges (S. 152)	1	S	1.5	Franke
25299	Business Strategies of Banks (S. 153)	2	W	3	Müller
26570	International Finance (S. 220)	2	S	3	Uhrig-Homburg, Walter
26454	eFinance: Information Engineering and Management for Securities Trading (S. 211)	2/1	W	4.5	Weinhardt, Riordan

Module: Risk and Insurance Management**Module key: [IW3BWLFBV3]****Subject:** Business Administration (Specialization)**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4 (2), 2, 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. An oral examination takes place at the end of semester.

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.

Prerequisites

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

Conditions

It is only possible to choose this module in combination with the module *Insurance Management* [IW3BWLFBV4].

Learning Outcomes**Content****Courses in module *Risk and Insurance Management* [IW3BWLFBV3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25055	Principles of Insurance Management (S. 137)	3/0	W	4.5	Werner
26326	Enterprise Risk Management (S. 203)	3/0	W/S	4.5	Werner

Remarks

The course *Enterprise Risk Management* [26326] is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

Module: Insurance Management

Module key: [IW3BWLFBV4]

Subject: Business Administration (Specialization)

Module coordination: Ute Werner

Credit points (CP): 9

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4 (2), 2, 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. An oral examination takes place at the end of semester.

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.

Prerequisites

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

Conditions

The course *Principles of Insurance Management* [25055] has to be attended.

It is only possible to choose this module in combination with the module *Risk and Insurance Management* [IW3BWLFBV3].

Learning Outcomes

Content

Courses in module *Insurance Management* [IW3BWLFBV4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26323	Insurance Marketing (S. 202)	3/0	W/S	4.5	Werner
25050	Private and Social Insurance (S. 136)	2/0	W	2.5	Werner, Heilmann, Besserer
25055	Principles of Insurance Management (S. 137)	3/0	W	4.5	Werner
26360	Insurance Contract Law (S. 204)	3/0	S	4.5	Werner, Schwebler

Remarks

The course *Insurance Marketing* [26323] is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

Module: Insurance: Calculation and Control**Module key: [IW3BWLFVBV2]****Subject:** Business Administration (Specialization)**Module coordination:** Christian Hipp**Credit points (CP):** 9**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).

Prerequisites

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Insurance: Calculation and Control* [IW3BWLFVBV2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26300	Insurance Models (S. 201)	2/2	S	5	Hipp
26372	Insurance Game (S. 205)	2	S	4	Hipp

Module: Foundations of Marketing

Module key: [IW3BWLMAR]

Subject: Business Administration (Specialization)

Module coordination: Wolfgang Gaul, Bruno Neibecker

Credit points (CP): 9

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 lectures and influence the final grade positively.

Prerequisites

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

Conditions

The course *Marketing and Consumer Behavior* [25150] has to be attended.

Learning Outcomes

Content

Courses in module *Foundations of Marketing* [IW3BWLMAR]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25150	Marketing and Consumer Behavior (S. 143)	2/1	W	4.5	Gaul
25154	Modern Market Research (S. 144)	2/1	S	4.5	Gaul
25156	Marketing and Operations Research (S. 145)	2/1	S	4.5	Gaul
25177	Brand Management (S. 147)	2/1	W	4.5	Neibecker

Module: Strategy and Organization**Module key: [IW3BWL001]****Subject:** Business Administration (Specialization)**Module coordination:** Hagen Lindstädt**Credit points (CP):** 9**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 separately.

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

Prerequisites

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Strategy and Organization* [IW3BWL001]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25900	Management and Strategy (S. 189)	2/0	S	4	Lindstädt
25902	Managing Organizations (S. 190)	2/0	W	4	Lindstädt
25907	Special Topics in Management: Management and IT (S. 191)	1/0	W/S	2	Lindstädt

Remarks

Module: Energy Economics

Module key: [IW3BWLIP2]

Subject: Business Administration (Specialization)

Module coordination: Wolf Fichtner

Credit points (CP): 9

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 separately.

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

Prerequisites

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

Conditions

None.

Learning Outcomes

Content

Courses in module *Energy Economics* [IW3BWLIP2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26010	Introduction in to Energy Economics (S. 198)	2/2	S	5.5	Fichtner
26012	Renewable Energy Sources - Technologies and Potentials (S. 199)	2/0	W	3.5	Fichtner
25959	Energy Policy (S. 195)	2/0	S	3.5	Wietschel

Module: Industrial Production I**Module key: [IW3BWLIIIP1]****Subject:** Business Administration (Specialization)**Module coordination:** Frank Schultmann**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2), 1 of the examination regulation) about *Fundamentals of Production Management* [25950] and one optional course of this module.

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

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

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

Prerequisites

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

Conditions

The course *Fundamentals of Production Management* [25950] is obligatory. In addition to that one more course has to be chosen. Each course can be chosen independently.

With consecutive master programme in mind, it is recommended to enroll on the module *Industrial Production II* [WW4BWLIIIP2] and / or *Industrial Production III* [WW4BWLIIIP6] as well.

Learning Outcomes

see German version

Content

see German version

Courses in module *Industrial Production I* [IW3BWLIIIP1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25950	Fundamentals of Production Management (S. 194)	2/2	S	5.5	Schultmann
25960	Material and Energy Flows in the Economy (S. 196)	2/0	W	3.5	Hiete
25996	Logistics and Supply Chain Management (S. 197)	2/0	W	3.5	Schultmann

Module: Sustainable Construction

Module key: [WW3BWLOOW1]

Subject: Business Administration (Specialization)

Module coordination: Thomas Lützkendorf

Credit points (CP): 9

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 separately.

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.

Prerequisites

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

Conditions

The combination with the module *Real Estate Management* [WW3BWLOOW2] 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 advantage 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 advantage 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.

Courses in module *Sustainable Construction* [WW3BWLOOW1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26404w	Design, Construction and Assessment of Green Buildings I (S. 209)	2/1	W	4,5	Lützkendorf
26404	Sustainability Assessment of Construction Works (S. 208)	2/1	S	4,5	Lützkendorf

Module: Real Estate Management**Module key: [WW3BWLOOW2]****Subject:** Business Administration (Specialization)**Module coordination:** Thomas Lützkendorf**Credit points (CP):** 9**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 separately.

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

It is possible to include the grade of a seminar paper, dealing with a topic from the area of 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.

Prerequisites

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

Conditions

The combination with the module *Design Constructions and Assessment of Green Buildings* [WW3BWLOOW1] 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 and 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.

Courses in module *Real Estate Management* [WW3BWLOOW2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26400w	Real Estate Management I (S. 207)	2/2	W	4,5	Lützkendorf
26400	Real Estate Management II (S. 206)	2/2	S	4,5	Lützkendorf

4.3 Economics

Module: Applied Game Theory

Module key: [IW3VWL1]

Subject: Economics (Specialization)

Module coordination: Siegfried Berninghaus

Credit points (CP): 9

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 offered 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.

Prerequisites

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

Conditions

Good knowledge of mathematics and statistics is recommended.

One of the lectures *Game Theory I* [25525] or *Game Theory II* [25369] has to be completed. Overall there has to be absolved examinations at at least 9 Credits.

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.

Courses in module *Applied Game Theory* [IW3VWL1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25525	Game Theory I (S. 165)	2/2	S	4.5	Berninghaus
25369	Game Theory II (S. 157)	2/2	W	4.5	Berninghaus
25371	Industrial Organization (S. 158)	2/1	S	4.5	Berninghaus
25373	Experimental Economics (S. 159)	2/1	S	4,5	Berninghaus, Bleich

Module: Strategic Games**Module key: [IW3VWL4]****Subject:** Economics (Specialization)**Module coordination:** Siegfried Berninghaus**Credit points (CP):** 9**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 offered 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.

Prerequisites

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

Conditions

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 taught 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.

Courses in module *Strategic Games* [IW3VWL4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25525	Game Theory I (S. 165)	2/2	S	4.5	Berninghaus
25369	Game Theory II (S. 157)	2/2	W	4.5	Berninghaus
25365	Economics of Uncertainty (S. 156)	2/2	S	4.5	Ehrhart

Module: Microeconomic Theory

Module key: [IW3VWL6]

Subject: Economics (Specialization)

Module coordination: Clemens Puppe

Credit points (CP): 9

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

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 grade of the term paper can improve the overall grade of the module up to third but at least up to an improvement of one grading scale. 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://vw1.ets.kit.edu/>).

Prerequisites

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

Conditions

None.

Learning Outcomes

Content

Courses in module *Microeconomic Theory* [IW3VWL6]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25527	Advanced Microeconomic Theory (S. 166)	2/1	S	4.5	Puppe
25517	Welfare Economics (S. 164)	2/1	S	4.5	Puppe
25525	Game Theory I (S. 165)	2/2	S	4.5	Berninghaus

Module: Macroeconomic Theory**Module key: [IW3VWL8]****Subject:** Economics (Specialization)**Module coordination:** Clemens Puppe**Credit points (CP):** 9**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 separately.

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 grade of the term paper can improve the overall grade of the module up to third but at least up to an improvement of one grading scale. 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/>).

Prerequisites

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Macroeconomic Theory* [IW3VWL8]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25543	Theory of Economic Growth (S. 167)	2/1	S	4.5	Hillebrand
25549	Theory of Business Cycles (S. 168)	2/1	W	4.5	Hillebrand

Module: Statistical Applications of Financial Risk Management**Module key: [IW3VWL]****Subject:** Economics (Specialization)**Module coordination:** Svetlozar Rachev**Credit points (CP):** 9**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 separately.

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

Prerequisites

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Statistical Applications of Financial Risk Management* [IW3VWL]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25325	Statistics and Econometrics in Business and Economics (S. 154)	2/2	W	4.5	Heller
25016	Economics III: Introduction in Econometrics (S. 135)	2/2	S	5	Höchstötter
25355	Bank Management and Financial Markets, Applied Econometrics (S. 155)	2/2	S	5	Vollmer
25375	Data Mining (S. 160)	2	W	5	Nakhaeizadeh

4.4 Operations Research

Module: Applications of Operations Research

Module key: [IW3OR5]

Subject: OR (Specialization)

Module coordination: Stefan Nickel

Credit points (CP): 9

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 separately.

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

Prerequisites

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.

Conditions

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 Supply Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

Courses in module *Applications of Operations Research* [IW3OR5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25486	Facility Location and Strategic Supply Chain Management (S. 161)	2/1	S	4.5	Nickel
25488	Tactical and Operational Supply Chain Management (S. 162)	2/1	W	4.5	Nickel
25490	Software Laboratory: OR Models I (S. 163)	1/2	W	4.5	Nickel
25134	Global Optimization I (S. 141)	2/1	W	4.5	Stein
25136	Global Optimization II (S. 142)	2/1	W	4.5	Stein
25662	Simulation I (S. 169)	2/1/2	W	4.5	Waldmann

Remarks

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

Module: Methodical Foundations of OR**Module key: [IW3OR6]****Subject:** OR (Specialization)**Module coordination:** Oliver Stein**Credit points (CP):** 9**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 separately.

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

Prerequisites

None.

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 possibilities for global solutions.

Courses in module *Methodical Foundations of OR* [IW3OR6]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25111	Nonlinear Optimization I (S. 139)	2/1	S	4.5	Stein
25113	Nonlinear Optimization II (S. 140)	2/1	S	4.5	Stein
25134	Global Optimization I (S. 141)	2/1	W	4.5	Stein
25136	Global Optimization II (S. 142)	2/1	W	4.5	Stein
25486	Facility Location and Strategic Supply Chain Management (S. 161)	2/1	S	4.5	Nickel
25679	Markov Decision Models I (S. 171)	2/1/2	W	4.5	Waldmann

Remarks

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

This module is offered for the first time in winter 2009/10.

Module: Stochastic Methods and Simulation**Module key: [IW3OR7]****Subject:** OR (Specialization)**Module coordination:** Karl-Heinz Waldmann**Credit points (CP):** 9**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 separately.

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

Prerequisites

None.

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:

Markov Chains, Poisson Processes, Markov Chains in Continuous Time, Queuing Systems.

Discrete event simulation, generation of random numbers, generating discrete and continuous random variables, statistical analysis of simulated data

Variance reduction techniques, simulation of stochastic processes, case studies.

Courses in module *Stochastic Methods and Simulation* [IW3OR7]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25679	Markov Decision Models I (S. 171)	2/1/2	W	4.5	Waldmann
25662	Simulation I (S. 169)	2/1/2	W	4.5	Waldmann
25665	Simulation II (S. 170)	2/1/2	S	4.5	Waldmann
25111	Nonlinear Optimization I (S. 139)	2/1	S	4.5	Stein
25488	Tactical and Operational Supply Chain Management (S. 162)	2/1	W	4.5	Nickel

Remarks

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

This module is offered for the first time in sinter 2009/10.

4.5 Informatics

Module: Web Information Systems

Module key: [IW3INAIFB1]

Subject: Informatics (Specialization)

Module coordination: Stefan Tai

Credit points (CP): 10

Learning Control / Examinations

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

Prerequisites

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

Conditions

None.

Learning Outcomes

Content

Courses in module *Web Information Systems* [IW3INAIFB1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25770	Service Oriented Computing 1 (S. 185)	2/1	W	5	Tai
25776	Cloud Computing (S. 186)	2/1	W	5	Tai, Kunze

Module: Semantic Knowledge Management**Module key: [IW3INAIFB2]****Subject:** Informatics (Specialization)**Module coordination:** Rudi Studer**Credit points (CP):** 10**Learning Control / Examinations**

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

Prerequisites

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

Conditions

Lecture *Semantic Web Technologies I* [25748] is mandatory.

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.

Courses in module *Semantic Knowledge Management* [IW3INAIFB2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25748	Semantic Web Technologies I (S. 182)	2/1	W	5	Studer, Rudolph
25740	Knowledge Management (S. 181)	2/1	W	5	Studer
25736	Business Process Modelling (S. 180)	2/1	W	5	Oberweis, Mevius

Module: Semantic Web and Applications**Module key: [IW3INAIFB3]****Subject:** Informatics (Specialization)**Module coordination:** Rudi Studer**Credit points (CP):** 8**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.

Prerequisites

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Semantic Web and Applications* [IW3INAIFB3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25748	Semantic Web Technologies I (S. 182)	2/1	W	5	Studer, Rudolph
25070s	Seminar in Applied Informatics (S. 138)	2	W/S	3	Oberweis, Schmeck, Seese, Stucky, Studer, Tai

Module: Information Services in Networks**Module key: [IW3INAIFB4]****Subject:** Informatics (Specialization)**Module coordination:** Hartmut Schmeck**Credit points (CP):** 9**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Information Services in Networks* [IW3INAIFB4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications (S. 174)	2/1	W	5	Schmeck
24074	Vernetzte IT-Infrastrukturen (S. 110)	2/1	W	5	Juling
24124	Web Engineering (S. 118)	2/0	W	4	Nußbaumer
25776	Cloud Computing (S. 186)	2/1	W	5	Tai, Kunze
25748	Semantic Web Technologies I (S. 182)	2/1	W	5	Studer, Rudolph
xIDLp	Practical Course Information Services in Networks (S. 243)	4	W/S	4	Schmeck, Tai, Juling, Tichy, Studer, Hartenstein

Module: Algorithms and Applications**Module key: [IW3INAIFB5]****Subject:** Informatics (Specialization)**Module coordination:** Hartmut Schmeck**Credit points (CP):** 9**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Algorithms and Applications* [IW3INAIFB5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25700	Efficient Algorithms (S. 172)	2/1	S	5	Schmeck
25702	Algorithms for Internet Applications (S. 174)	2/1	W	5	Schmeck
25706	Nature-inspired Optimisation (S. 177)	2/1	W	5	Mostaghim, Shukla
25704	Organic Computing (S. 175)	2/1	S	5	Schmeck, Mostaghim
25700sp	Special Topics of Efficient Algorithms (S. 173)	2/1	W/S	5	Schmeck

Module: Business Process Engineering**Module key: [IW3INAIFB6]****Subject:** Informatics (Specialization)**Module coordination:** Andreas Oberweis**Credit points (CP):** 10**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Business Process Engineering* [IW3INAIFB6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25726	Workflow-Management (S. 178)	2/1	S	5	Oberweis
25736	Business Process Modelling (S. 180)	2/1	W	5	Oberweis, Mevius
25770	Service Oriented Computing 1 (S. 185)	2/1	W	5	Tai
PraBI	Computing Lab Information Systems (S. 229)	2	W/S	5	Oberweis, Seese, Stucky, Studer

Module: Business Processes and Information Systems**Module key: [IW3INAIFB7]****Subject:** Informatics (Specialization)**Module coordination:** Andreas Oberweis**Credit points (CP):** 8**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Business Processes and Information Systems* [IW3INAIFB7]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25786	Enterprise Architecture Management (S. 187)	2/1	W	5	Wolf
25730	Software Technology: Quality Management (S. 179)	2/1	S	5	Oberweis
25790	Capability maturity models for software and systems engineering (S. 188)	2	S	4	Kneuper
25740	Knowledge Management (S. 181)	2/1	W	5	Studer
SBI	Special Topics of Enterprise Information Systems (S. 231)	2/1	W/S	5	Oberweis, Stucky
SemAIFB1	Seminar in Enterprise Information Systems (S. 233)	2	W/S	3	Studer, Oberweis, Stucky, Wolf, Kneuper

Module: Grundlagen von Informationssystemen**Module key: [IW3INGIS]****Subject:** Informatics (Specialization)**Module coordination:** Klemens Böhm**Credit points (CP):** 10**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module Grundlagen von Informationssystemen [IW3INGIS]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24118	Data Warehousing and Mining (S. 117)	2/1	W	5	Böhm
dbe	Deployment of Database Systems (S. 239)	2/1	W	5	Böhm
24111	Workflowmanagement-Systems (S. 115)	2	W	3	Mülle
24605	Datenschutz und Privatheit in vernetzten Informationssystemen (S. 130)	2	S	3	Buchmann
24603	The Digital Library (S. 129)	2	S	3	Schütte
PLV	Praxis des Lösungsvertriebs (S. 224)	2	S	1	Böhm, Hellriegel
PUB	Praxis der Unternehmensberatung (S. 227)	2	W/S	1	Böhm, Dürr
PMP	Projektmanagement aus der Praxis (S. 225)	2	S	1	Böhm, Schnober

Module: Communication and Database Systems**Module key: [IW3INKD]****Subject:** Informatics (Specialization)**Module coordination:** Klemens Böhm, Martina Zitterbart**Credit points (CP):** 8**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Communication and Database Systems* [IW3INKD]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24574	Communication and Database Systems (S. 127)	4/2	S	8	Böhm, Zitterbart

Module: Telematics**Module key: [IW3INTM]****Subject:** Informatics (Specialization)**Module coordination:** Martina Zitterbart**Credit points (CP):** 10**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Telematics* [IW3INTM]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24128	Telematics (S. 120)	2	W	4	Zitterbart
PXT	Praxis der Telematik (S. 228)	1	W	2	Zitterbart
24643	Mobile Communication (S. 134)	2/0	S	4	Waldhorst
24601	Network Security: Architectures and Protocols (S. 128)	2/0	S	4	Schöller
24132	Multimedia Communication (S. 121)	2/0	W	4	Bless
24149	Network and IT-Security Management (S. 122)	2/1	W	5	Hartenstein
PrakATM	Praktikum Advanced Telematics (S. 230)	2	W/S	5	Zitterbart

Module: Algorithms II**Module key: [IW3INALG2]****Subject:** Informatics (Specialization)**Module coordination:** Dorothea Wagner, Peter Sanders**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Algorithms II* [IW3INALG2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079	Algorithm Design (S. 112)	3/1	W	6	Wagner, Sanders

Module: Algorithm Design**Module key: [IW3INALGT]****Subject:** Informatics (Specialization)**Module coordination:** Dorothea Wagner**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Algorithm Design* [IW3INALGT]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24614	Algorithms for Planar Graphs (S. 131)	2/1	S	3	Wagner
24171	Randomized Algorithms (S. 123)	2	W	3	Worsch
xAlgoEng	Algorithm Engineering (S. 242)	2	W/S	3	Sanders, Wagner
xParallAlgo	Parallel Algorithms (S. 245)	2	W/S	3	Sanders
AlgoMO	Algorithmic Methods for Hard Optimization Problems (S. 223)	2	W/S	3	Wagner, Sanders
24621	Algorithms for Visualization of Graphs (S. 132)	2/1	S	3	Wagner, Nöllenburg

Module: Praktikum Algorithmentechnik**Module key: [IW3INALGOP]****Subject:** Informatics (Specialization)**Module coordination:** Dorothea Wagner**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes**Content****Courses in module *Praktikum Algorithmentechnik* [IW3INALGOP]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079p	Practical Course in Algorithm Design (S. 113)	4	W/S	6	Sanders, Wagner, Krug

Module: Security**Module key: [IW3INSICH]****Subject:** Informatics (Specialization)**Module coordination:** Jörn Müller-Quade**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Security* [IW3INSICH]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
sich	Sicherheit (S. 241)	3/1	S	6	Müller-Quade

Module: Public Key Kryptographie**Module key: [IW3INPKK]****Subject:** Informatics (Specialization)**Module coordination:** Jörn Müller-Quade**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Public Key Kryptographie* [IW3INPKK]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24115	Public Key Kryptographie (S. 116)	3	W	6	Müller-Quade

Module: Software Engineering I**Module key: [IW3INSWT1]****Subject:** Informatics (Specialization)**Module coordination:** Walter F. Tichy, Ralf Reussner**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Software Engineering I* [IW3INSWT1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24518	Software Engineering I (S. 125)	3/1/2	S	6	Tichy, Höfer, Meder

Module: Softwaretechnik II**Module key: [IW3INSWT2]****Subject:** Informatics (Specialization)**Module coordination:** Ralf Reussner, Walter F. Tichy**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Softwaretechnik II* [IW3INSWT2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
SWT2	Software Engineering II (S. 232)	3/1	W	6	Reussner, Tichy

Module: Programmierparadigmen**Module key: [IW3IWPROGP]****Subject:** Informatics (Specialization)**Module coordination:** Gregor Snelting**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Programmierparadigmen* [IW3IWPROGP]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
PPD	Programmierparadigmen (S. 226)	3/1	W	6	Snelting, Reussner

Module: Fortgeschrittene Objektorientierung**Module key: [IW3INFOO]****Subject:** Informatics (Specialization)**Module coordination:** Gregor Snelting**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Fortgeschrittene Objektorientierung* [IW3INFOO]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24639	Fortgeschrittene Objektorientierung (S. 133)	3/2	S	6	Snelting

Module: Energiebewusste Betriebssysteme**Module key: [IW3INEBB]****Subject:** Informatics (Specialization)**Module coordination:** Frank Bellosa**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Energiebewusste Betriebssysteme* [IW3INEBB]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24127	Power Management (S. 119)	2	W	3	Bellosa
24181	Power Management Praktikum (S. 124)	2	W	3	Bellosa, Merkel

Module: Rechnerstrukturen**Module key: [IW3INRS]****Subject:** Informatics (Specialization)**Module coordination:** Wolfgang Karl**Credit points (CP):** 6**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Rechnerstrukturen* [IW3INRS]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24570	Rechnerstrukturen (S. 126)	3/1	S	6	Henkel, Karl

4.6 Law

Module: Intellectual Property and Data Protection

Module key: [IW3JURA]

Subject: Law (Specialization)

Module coordination: Thomas Dreier

Credit points (CP): 6

Learning Control / Examinations

Prerequisites

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.

Conditions

None.

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...

Courses in module *Intellectual Property and Data Protection* [IW3JURA]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24070	Industrial Property and Copyright Law (S. 108)	2/0	W	3	Dreier
24018	Data Protection Law (S. 107)	2/0	W	3	Spiecker genannt Döhmann

5 Courses

5.1 Courses of term 1-4

Course: Grundbegriffe der Informatik

Course key: [24001]

Lecturers: Thomas Worsch

Credit points (CP): 5 **Hours per week:** 2/1/2

Term: Wintersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Foundations in Informatics [IW1INF1] (S. [14](#))

Learning Control / Examinations

Prerequisites

None.

Conditions

None.

Learning Outcomes

Content

Basic literature

None.

Complementary literature

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

Course: Programming**Course key: [24004]****Lecturers:** Gregor Snelting**Credit points (CP):** 5 **Hours per week:** 2/0/2**Term:** Wintersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Foundations in Informatics [IW1INF1] (S. [14](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

See german version.

Content

See german version.

Basic literature

P. Pepper, Programmieren Lernen, Springer, 3. Auflage 2007

Complementary literature

B. Eckels: Thinking in Java. Prentice Hall 2006

J. Bloch: Effective Java, Addison-Wesley 2008

Course: Algorithms I**Course key: [24500]****Lecturers:** Peter Sanders**Credit points (CP):** 6 **Hours per week:** 3/1/2**Term:** Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Algorithms I [IW2INF2] (S. 15)**Learning Control / Examinations**

The assessment is described in the module.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**

Algorithms and Data Structures – The Basic Toolbox

K. Mehlhorn und P. Sanders

Springer 2008

Complementary literature

Algorithmen - Eine Einführung

T. H. Cormen, C. E. Leiserson, R. L. Rivest, und C. Stein

Oldenbourg, 2007

Algorithmen und Datenstrukturen

T. Ottmann und P. Widmayer

Spektrum Akademischer Verlag, 2002

Algorithmen in Java. Teil 1-4: Grundlagen, Datenstrukturen, Sortieren, Suchen

R. Sedgewick

Pearson Studium 2003

Algorithm Design

J. Kleinberg and É. Tardos

Addison Wesley, 2005

Vöcking et al.

Taschenbuch der Algorithmen

Springer, 2008

Course: Theoretische Grundlagen der Informatik**Course key: [theogrundinfo]****Lecturers:** Jörn Müller-Quade**Credit points (CP):** 7 **Hours per week:** 3/1**Term:** Wintersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Theoretical Informatics [IW2INF3] (S. [16](#))**Learning Control / Examinations**

The assessment ist described in the module.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

- Uwe Schöning: Theoretische Informatik - kurz gefasst. Spektrum (2001).
- Ingo Wegener: Theoretische Informatik. Teubner (1999)
- Ingo Wegener: Kompendium theoretische Informatik. Teubner (1996).

Course: Rechnerorganisation**Course key: [24502]****Lecturers:** Tamim Asfour, Rüdiger Dillmann, Jörg Henkel, Wolfgang Karl**Credit points (CP):** 6 **Hours per week:** 3/1/2**Term:** Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Computer Engineering [IW2INF4] (S. [17](#))**Learning Control / Examinations**

The assessment is described in the module.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

- D. Patterson, J. Hennessy: Rechnerorganisation und -entwurf
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: Applied Informatics I - Modelling**Course key: [25070]****Lecturers:** Andreas Oberweis, Rudi Studer, Sudhir Agarwal**Credit points (CP):** 4 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Applied Informatics [IW1INF5] (S. 18)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

Content

In the context of complex information systems, modelling is of central importance, e.g. – in the context of systems to be developed – for a better understanding of their functionality or in the context of existing systems for supporting maintenance and further development.

Modelling, in particular modelling of information systems, forms the core part of this lecture. The lecture is organized in two parts. The first part mainly covers the modelling of static aspects, the second part covers the modelling of dynamic aspects of information systems.

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

Media

Slides.

Basic 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.

Complementary 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**Course key: [25033]****Lecturers:** Stefan Tai**Credit points (CP):** 4 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Applied Informatics [IW1INF5] (S. [18](#))**Learning Control / Examinations****Prerequisites**Knowledge of content of the courses *Foundations of Informatics I* [25074] and *Foundations of Informatics II* [25076] is expected.**Conditions**

None.

Learning Outcomes

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

Content

The course introduces methods and systems in support of electronic commerce, including the topics:

- application architectures (incl. client server architectures)
- document description and exchange (incl. XML)
- enterprise middleware (incl. CORBA, Messaging Middleware, Java Enterprise Edition)
- Web services and SOA

Media

Slides, internet resources.

Basic literature

Tba in the lecture.

Course: Financial Accounting and Cost Accounting**Course key: [25002/25003]****Lecturers:** Thomas Burdelski**Credit points (CP):** 4 **Hours per week:** 2/2**Term:** Wintersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Foundations in Business Administration [IW1BWL1] (S. 19)**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

slides

Basic literature

- R. Buchner, Buchführung und Jahresabschluss, Vahlen Verlag
- A. Coenenberg, Jahresabschluss und Jahresabschlussanalyse, Verlag Moderne Industrie
- A. Coenenberg, Kostenrechnung und Kostenanalyse, Verlag Moderne Industrie
- R. Ewert, A. Wagenhofer, Interne Unternehmensrechnung, Springer Verlag
- J. Schöttler, R. Spulak, Technik des betrieblichen Rechnungswesen, Oldenbourg Verlag

Course: Introduction to Information Engineering and Management Course key: [26490]

Lecturers: Christof Weinhardt, Andreas Geyer-Schulz

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

Term: Sommersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Foundations in Business Administration [IW1BWL1] (S. 19)

Learning Control / Examinations

The assessment of the course *Introduction to Information Engineering and Management* is a written exam according to §4(2), 1 of the examination regulation. The duration of the exam is 60 minutes. There are 100 points possible.

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

The student

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

Content

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

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

- The foundation of a company: Choosing the legal form and financing
- Financial planning and investment
- Information and information technology
- Outsourcing und horizontale Unternehmensintegration
- Service Engineering
- Electronic markets
- Logistics/SCM
- Web/Internet-Marketing

- Production and Procurement

Media

Web, Audio/Slides, Full Text Documents.

Basic literature

- 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.

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

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

Credit points (CP): 4 **Hours per week:** 2/0/2

Term: Sommersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Business Administration [IW1BWL2] (S. 20)

Learning Control / Examinations**Prerequisites**

None.

Conditions

None.

Learning Outcomes

The target of this course and the tutorials of this course are the basic points of marketing, production economics and information engineering and management.

After this basic course students have to be familiar with these three topics in Business Administration and Management Science.

Content**1. Marketing:**

Marketing is an organizational function to handle situations, activities, and processes for creating, communicating, and delivering value to customers in a best way. (Customer) relationship management comprises collecting, aggregating, and analyzing information (e.g., developments in the society, changing conditions of markets, alterations w.r.t. buying behavior) to benefit different target groups.

Main topics will deal with market research and optimized application of marketing mix instruments with emphasis on "marketing and the web", "innovation management", and "international marketing".

2. Production economics

In the part of production economics the student will learn basics in the field of production theory, procurement and resource acquisitions, production and operations management and industrial engineering.

Aspects of electrical engineering industry, technological foresights, construction industry and real estate markets will be treated.

3. Information engineering and management

In today's economy, information is a competitive factor that calls for an interdisciplinary investigation from economics and business administration, informatics and law. In this part of the lecture, selected topics from information engineering and management and their impact in market competition are presented

Topics include: Information in a company, Information processing: From an agent to business networks, social networks, service value networks, complex service auction, market engineering, physioeconomics, grid und cloud computing, dynamic pricing.

Basic literature

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

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

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

Credit points (CP): 4 **Hours per week:** 2/0/2

Term: Wintersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Business Administration [IW1BWL2] (S. 20)

Learning Control / Examinations

Prerequisites

None.

Conditions

None.

Learning Outcomes

The goal of this course and the tutorials of this course is to equip students with the fundamentals and basics in the fields of management and organization, investment 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)

Basic literature

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

Course: Introduction to Operations Research I**Course key: [25040]****Lecturers:** Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann**Credit points (CP):** 4.5 **Hours per week:** 2/2/2**Term:** Sommersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Introduction to Operations Research [IW1OR] (S. [22](#))**Learning Control / Examinations**

See module description.

Prerequisites

See module information.

Conditions

None.

Learning Outcomes

See module information.

Content

Examples for typical OR problems.

Linear Programming: Basic notions, simplex method, duality, special versions of the simplex method (dual simplex method, three phase method), sensitivity analysis, parametric optimization, game theory.

Graphs and Networks: Basic notions of graph theory, shortest paths in networks, project scheduling, maximal and minimal cost flows in networks.

Media

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

Basic literature

Lecture notes

Complementary literature

- 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**Course key: [25043]****Lecturers:** Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann**Credit points (CP):** 4.5 **Hours per week:** 2/2/2**Term:** Wintersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Introduction to Operations Research [IW1OR] (S. [22](#))**Learning Control / Examinations**

See module description.

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

None.

Learning Outcomes

See module information.

Content

Integer and Combinatorial Programming: Basic notions, cutting plane methods, branch and bound methods, branch and cut methods, heuristics.

Nonlinear Programming: Basic notions, optimality conditions, solution methods for convex and nonconvex optimization problems.

Dynamic and stochastic models and methods: dynamical programming, Bellman method, lot sizing models, dynamical and stochastic inventory models, queuing theory.

Media

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

Basic literature

Lecture notes

Complementary literature

- 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: Economics I: Microeconomics**Course key: [25512]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 5 **Hours per week:** 3/0/2**Term:** Wintersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Economics [IW1VWL] (S. 21)**Learning Control / Examinations**

The assessment consists of a written exam (120 min) following §4, Abs. 2, 1 of the examination regulation.

There may be offered a practice exam in the middle of the semester. The results of this exam may be used to improve the grade of the main exam. A detailed description of the examination modalities will be given by the respective lecturer.

The main exam takes place subsequent to the lecture. The re-examination is offered at the same examination period. Only repeating candidates are entitled to taking place the re-examination. For a detailed description on the exam regulations see the information of the respective chair.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

In particular, the student should learn

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

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

- to analyze the structure of microeconomics relationships and possibly to present own problem solutions,

Content

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

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

Media

downloadable from IT server

Basic literature

- H. Varian, Grundzüge der Mikroökonomik, 5. edition (2001), Oldenburg Verlag
- Pindyck, Robert S./Rubinfeld, Daniel L., Mikroökonomie, 6. Aufl., Pearson. München, 2005
- Frank, Robert H., Microeconomics and Behavior, 5. Aufl., McGraw-Hill, New York, 2005

Complementary literature

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

Course: Statistics I**Course key: [25008/25009]****Lecturers:** Markus Höchstötter**Credit points (CP):** 5 **Hours per week:** 4/0/2**Term:** Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Statistics [IW1STAT] (S. 23)**Learning Control / Examinations**

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

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

Prerequisites

None.

Conditions

None.

Learning Outcomes

The Student should understand and apply

- the basic concepts of statistical data exploration
- the basic definitions and theorems of probability theory

Content

A. Descriptive Statistics: univariate und bivariate analysis

B. Probability Theory: probability space, conditional and product probabilities

Media

lecture notes

Basic literature

Skriptum: Kurzfassung Statistik I

Complementary literature

- Bol, G.: Deskriptive Statistik, 5. Aufl., Oldenbourg, München etc., 2001
- 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**Course key: [25020/25021]****Lecturers:** Markus Höchstötter**Credit points (CP):** 5 **Hours per week:** 4/0/2**Term:** Wintersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Statistics [IW1STAT] (S. 23)**Learning Control / Examinations**

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

The exam takes place at the end of the lecture period or at the beginning of the recess period. The re-examination takes place in the following semester.

Prerequisites

It is recommended to attend the course *Statistics I* [25008/25009] before the course *Statistics II* [25020/25021].

Conditions

None.

Learning Outcomes

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

Content

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

C. Theory of estimation and testing: sufficiency of statistics, point estimation (optimality, ML-method), interval estimations, theory of tests (optimality, most important examples of tests)

Media

lecture notes

Basic literature

Script: Kurzfassung Statistik II

Complementary literature

- Bohley, P.: Statistik, 5. Aufl., Oldenbourg, München etc., 1992
- Bol, G.: 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.: Standard Probability and Statistics Tables and Formulae, 2. Aufl., CRC, Boca Raton etc., 2000

Course: Civil Law for Beginners**Course key: [24012]****Lecturers:** Thomas Dreier, Peter Sester**Credit points (CP):** 4 **Hours per week:** 4/0**Term:** Wintersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Introduction to Civil Law [IW1JURA1] (S. 24)**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Transparencies/Slides

Basic literature

Tba at the beginning of the course,

Complementary literature

Tba at the beginning of the course,

Course: Advanced Civil Law**Course key: [24504]****Lecturers:** Thomas Dreier, Peter Sester**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Commercial Law [IW1JURA2] (S. 25)**Learning Control / Examinations**

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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

Content

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

Media

Transparencies/Slides

Basic literature

Tba at the beginning of the course.

Complementary literature

tba at the beginning of the course

Course: Commercial and Corporate Law**Course key: [24011]****Lecturers:** Peter Sester**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Commercial Law [IW1JURA2] (S. [25](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Media**

Folien

Basic literature

Klunzinger, Eugen

- 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

Complementary literature

tba in Vorlesungsfolien

Course: Exercises in Civil Law**Course key: [24506/24017]****Lecturers:** Peter Sester, Thomas Dreier**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Winter-/Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Commercial Law [IW1JURA2] (S. [25](#))**Learning Control / Examinations**

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides

Basic literature

tba in the course.

Course: Public Law I - Basic Principles**Course key: [24016]****Lecturers:** Indra Spiecker genannt Döhmann**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Constitutional and Administrative Law [IW1JURA3] (S. [26](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

[Jonas wiederherstellen]

Content

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

Media

abstracts, sketches on blackboard, slides

Basic literature

tba in scriptum

Complementary literature

tba in scriptum

Remarks

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

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

Course: Public Law II - Public Economic Law**Course key: [24520]****Lecturers:** Indra Spiecker genannt Döhmann**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 2**Teaching language:** Deutsch**Part of the modules:** Constitutional and Administrative Law [IW1JURA3] (S. 26)**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

content structure; documents

Basic literature

Will be announced in the lecture.

Complementary literature

tba in lecture slides

Remarks

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

1. In the winter term 2008/2009, Public Law I will be lectured.
2. In the summer term 2009, Public Law II will be lectured.

Course: Mathematics I for Information Engineering and Management Course key: [01360]

Lecturers: Andreas Rieder, Christian Wieners, Nicolas Neuss

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

Term: Wintersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Mathematics I [IW1MATH1] (S. 27)

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 examination has a weight of 80% and the certificates a weight of 20%.

Prerequisites

None.

Conditions

None.

Learning Outcomes

The aim of the course "Mathematics I" is to impart a comprehension of basic methods in linear algebra.

Content

The two lectures „Mathematics I and II for the subject area Information Systems“ ,edoate basic mathematical knowlegde which is 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

Basic literature

None.

Complementary literature

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

Course: Mathematics II for Information Engineering and Management Course key: [01877]

Lecturers: Andreas Rieder, Christian Wieners, Nicolas Neuss

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

Term: Sommersemester **Level:** 1

Teaching language: Deutsch

Part of the modules: Mathematics II [IW1MATH2] (S. 28)

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 examination has a weight of 80% and the certificate a weight of 20%.

Prerequisites

Mathematics I

Conditions

None.

Learning Outcomes

The aim of the course "Mathematics I" is to impart a comprehension of basic methods in analysis.

Content

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

Media

blackboard, data projector and transparencies if necessary

Basic literature

none

Complementary literature

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

5.2 Courses of term 5-6

Course: Logistics

Course key: [21078]

Lecturers: Kai Furmans

Credit points (CP): 6 **Hours per week:** 3/1

Term: Sommersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Supply Chain Management [IW3BWLISM2] (S. 35)

Learning Control / Examinations

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

Prerequisites

Required are lectures on "Linear Algebra" and "Stochastic".

Conditions

None.

Learning Outcomes

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

Content

Introduction

- historical overview
- lines of development

Structure of logistics systems

Distribution logistics

- location planning
- Vehicle Routing Planning
- distribution centers

Inventory management

- demand forecasting
- Inventory management policies
- Bullwhip effect

Production logistics

- layout planning
- material handling
- flow control

Supply Management

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

Identification Technologies

Media

Blackboard, Beramer, In Exercises also PCs

Complementary literature

- Arnold/Isermann/Kuhn/Tempelmeier. Handbuch Logistik, Springer Verlag, 2002 (Neuaufgabe in Arbeit)
- Domschke. Logistik, Rundreisen und Touren, Oldenbourg Verlag, 1982
- Domschke/Drexel. 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

Course: Data Protection Law**Course key: [24018]****Lecturers:** Indra Spiecker genannt Döhmann**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Intellectual Property and Data Protection [IW3JURA] (S. 79)**Learning Control / Examinations**

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

Prerequisites

Keine.

Conditions

None.

Learning Outcomes

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

Content

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

Media

abstracts, sketches on blackboard, slides

Basic literature

Will be announced in the course.

Complementary literature

Will be announced in the course.

Remarks

In cooperation with the House of Competence, Students should be rhetorical trained asking and answering questions (short-answer-and-question-technique). Therefore most likely a coach will attend several lessons.

Course: Industrial Property and Copyright Law**Course key: [24070]****Lecturers:** Thomas Dreier**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Intellectual Property and Data Protection [IW3JURA] (S. [79](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides.

Basic literature

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

Complementary literature

Additional literature tba

Course: Seminar “Selected Topics in Software Engineering”**Course key: [24073s]****Lecturers:** Walter F. Tichy**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Informatics [IW3SEMINFO] (S. [30](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Vernetzte IT-Infrastrukturen**Course key: [24074]****Lecturers:** Wilfried Juling**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Information Services in Networks [IW3INAIFB4] (S. [61](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

Dependencies according to the module.

Learning Outcomes

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

Content

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

Media

Slides

Basic literature

- 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.

Complementary 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: Seminar in Telematics**Course key: [24074s]****Lecturers:** Martina Zitterbart, Hannes Hartenstein**Credit points (CP):** 4 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Informatics [IW3SEMINFO] (S. 30)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

Students have the opportunity

- to do a literature research starting from a given subject to identify relevant literature and to review, and evaluate it.
- to identify independently issues that arise from subdomains of Telematics and to classify methods of resolution found in the literature.
- to generate 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 research in a written document in a way that is common practice for scientific publications.

Content

In this seminar, the focus lies on specific subjects that were partly introduced in the respective lectures and aims to discuss them more in detail. The following subjects are addressed:

- Future Internet: The focus of the seminar is on concepts for enabling the internet to cope with current and future requirements, including, e.g., mobility support, quality of service, and security. The discussed approaches span from incremental improvements of the current internet to a clean slate approach.
- Sensor networks: The seminar covers different new research results, e.g. concerning sensor architecture, communication technologies, special routing procedures, data aggregation, safety and algorithms in sensor networks etc.

starting WS 10/11:

- Network Security and Hacking Prevention: Attacks aimed at the infrastructure and applications of the Internet are the subject of this seminar. Having a firm understanding of the weaknesses, the students will examine protocols, mechanisms, and tools which can be used to provide secure communication.

Course: Algorithm Design**Course key: [24079]****Lecturers:** Dorothea Wagner, Peter Sanders**Credit points (CP):** 6 **Hours per week:** 3/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithms II [IW3INALG2] (S. 68)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

The students

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

Content

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

Basic literature

None

Complementary literature

- K. Mehlhorn, P. Sanders. Algorithms and Data Structures – The Basic Toolbox. Springer, 2008, to appear.
- T. H. Cormen, C. E. Leiserson, R. L. Rivest u.a. Introduction to Algorithms / Algorithmen – eine Einführung. MIT Press, 1990-2001 / Oldenburg 2004.
- Thomas Ottmann und Peter Widmayer. Algorithmen und Datenstrukturen. Spektrum, Akad. Verl., 1990-2002.
- Uwe Schöning. Algorithmik. Spektrum Akademischer Verlag, 2001.
- Reinhard Diestel. Graph Theory. Springer-Verlag, 2005.
- D. Jungnickel. Graphen, Netzwerke und Algorithmen. BI-Wissenschaftsverlag, 1994.
- J. D. Horton A polynomial-time algorithm to find the shortest cycle basis of a graph. SIAM Journal on Computing Vol. 16, Issue 12, 1987.
- Leon Peeters. Cyclic Railway Timetable Optimization. Dissertation, 2003.
- R. G. Downey, M. R. Fellows, Parameterized Complexity. Springer, 1999.

Course: Practical Course in Algorithm Design**Course key: [24079p]****Lecturers:** Peter Sanders, Dorothea Wagner, Marcus Krug**Credit points (CP):** 6 **Hours per week:** 4**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Praktikum Algorithmentchnik [IW3INALGOP] (S. [70](#))**Learning Control / Examinations****Prerequisites**Lecture *Algorithmentchnik***Conditions**

None.

Learning Outcomes

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

Content

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

Course: Seminar in Algorithm Design**Course key: [24079s]****Lecturers:** Dorothea Wagner**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Informatics [IW3SEMINFO] (S. [30](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

Students shall

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

Content

Various current topics that build upon the contents of the associated lectures.

Course: Workflowmanagement-Systems**Course key: [24111]****Lecturers:** Jutta Mülle**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. 65)**Learning Control / Examinations**

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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

Content

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

The course starts with discussing WFMS in the context of business-information systems and their relationship with the more common business-process modelling. Petri nets and pi-calculus are introduced as basic formalisms. Then, methods to model workflows and the design process for workflow-management applications are presented in detail and supplemented with exercises. An advanced aspect is new research in WFMS technology. In particular, the use of internet techniques like web services and standardization approaches for process modeling, orchestration, and choreography in service-oriented architectures will be presented. In the realization part of the course, various implementation techniques and architectural issues to realize workflow-management systems as well as diverse system types and concrete workflow-management systems are presented.

Media

Slides.

Basic literature

- W.M.P. van der Aalst. 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

Complementary 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 - ICDDT '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.

Course: Public Key Kryptographie**Course key: [24115]****Lecturers:** Jörn Müller-Quade**Credit points (CP):** 6 **Hours per week:** 3**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Public Key Kryptographie [IW3INPKK] (S. 72)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**

- Skript zur Vorlesung, <http://iaks-www.ira.uka.de/> (Zugangsdaten werden in der Vorlesung bekanntgegeben)

Complementary literature

- M. Bishop, Introduction to Computer Security, Addison-Wesley, Boston, 2005.
- J. Buchmann, Introduction to Cryptography, Springer, Heidelberg, 2003.
- J.D. Lipson, Elements of Algebra and Algebraic Computing, Addison-Wesley, 1981.
- A.J. Menezes, P.C. van Oorschot, S.A. Vanstone Handbook of Applied Cryptography CRC Press, 1997.
- W. Stallings, Cryptography and Network Security, Prentice Hall, New Jersey, 1999.
- W. Trappe, L. Washington, Introduction to Cryptography with Coding Theory, Prentice Hall, New Jersey, 2002.

Course: Data Warehousing and Mining**Course key: [24118]****Lecturers:** Klemens Böhm**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. 65)**Learning Control / Examinations**

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides.

Basic literature

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

Complementary literature

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

Course: Web Engineering**Course key: [24124]****Lecturers:** Martin Nußbaumer**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Information Services in Networks [IW3INAIFB4] (S. [61](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides

Basic literature

Gerti Kappel, Birgit Pröll, Siegfried Reich, Werner Retschitzegger (Hrsg.), Web Engineering - Systematische Entwicklung von Web- Anwendungen. dpunkt.verlag, ISBN:3-89864-234-8.

Thomas A. Powell, Web Site Engineering. Prentice Hall 1998.

Course: Power Management**Course key: [24127]****Lecturers:** Frank Bellosa**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Energiebewusste Betriebssysteme [IW3INEBB] (S. [77](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Telematics**Course key: [24128]****Lecturers:** Martina Zitterbart**Credit points (CP):** 4 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. 67)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

This course details selected protocols, architectures, techniques, and algorithms, which were already presented in the communications part of the course Communication and Database Systems [24574]. 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.

Basic literatureS. Keshav. *An Engineering Approach to Computer Networking*. Addison-Wesley, 1997J.F. Kurose, K.W. Ross. *Computer Networking: A Top-Down Approach Featuring the Internet*. 4rd Edition, Addison-Wesley, 2007W. Stallings. *Data and Computer Communications*. 8th Edition, Prentice Hall, 2006**Complementary 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 articles

Course: Multimedia Communication**Course key: [24132]****Lecturers:** Roland Bless**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. 67)**Learning Control / Examinations****Prerequisites**

The communication part of Kommunikation und Datenhaltung (recommended).

Conditions

None.

Learning Outcomes

Objective of the lecture is to present techniques, protocols, 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.

Basic literature

James F. Kurose, and Keith W. Ross *Computer Networking* 4th edition, Addison-Wesley/Pearson, 2007, ISBN 0-321-49770-8, Chapter Multimedia Networking.

Complementary 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 Telekommunikationsnetze*, Oldenbourg, 3.

Auflage, 2007

Course: Network and IT-Security Management**Course key: [24149]****Lecturers:** Hannes Hartenstein**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. 67)**Learning Control / Examinations****Prerequisites**

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

Conditions

Dependencies according to the module description.

Learning Outcomes

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

Content

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

Media

Slides

Basic literature

Jochen Dinger, Hannes Hartenstein, Netzwerk- und IT-Sicherheitsmanagement : Eine Einführung, Universitätsverlag Karlsruhe, 2008.

Complementary 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: Randomized Algorithms**Course key: [24171]****Lecturers:** Thomas Worsch**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. 69)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

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

Content

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

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

Contents:

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

Media

lecture notes and slides in pdf format;

Basic literature

- J. Hromkovic : Randomisierte Algorithmen, Teubner, 2004
- M. Mitzenmacher, E. Upfal: Probability and Computing, Cambridge Univ. Press, 2005
- R. Motwani, P. Raghavan: Randomized Algorithms, Cambridge Univ. Press, 1995

Complementary literature

- E. Behrends: Introduction to Markov Chains, Vieweg, 2000
- A. Borodin, R. El-Yaniv: Online Computation and Competitive Analysis, Cambridge Univ. Press, 1998

Course: Power Management Praktikum**Course key: [24181]****Lecturers:** Frank Bellosa, Merkel**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Energiebewusste Betriebssysteme [IW3INEBB] (S. [77](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Software Engineering I**Course key: [24518]****Lecturers:** Walter F. Tichy, Höfer, Meder**Credit points (CP):** 6 **Hours per week:** 3/1/2**Term:** Sommersemester **Level:** 1**Teaching language:** Deutsch**Part of the modules:** Software Engineering I [IW3INSWT1] (S. [73](#))**Learning Control / Examinations**

The assessment will consist of a 60 minute written exam according to § 4 Abs. 2 Nr. 1 SPO.

The grade of the module is the grade of the written exam.

Prerequisites

The passing of the module *Grundlagen der Informatik* [IW1INF1] is obligatory.

Conditions

None.

Learning Outcomes**Content****Media**

slides, tutorial papers

Basic literature

None.

Complementary 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
Beijing ; Köln [u.a.] : O'Reilly, 2008. - XXI, 290 S.
ISBN 0-596-52773-X, ISBN 978-0-596-52773-0

Course: Rechnerstrukturen**Course key: [24570]****Lecturers:** Jörg Henkel, Wolfgang Karl**Credit points (CP):** 6 **Hours per week:** 3/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Rechnerstrukturen [IW3INRS] (S. [78](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

- Hennessy, J.L., Patterson, D.A.: Computer Architecture: A Quantitative Approach. Morgan Kaufmann, 3.Auflage 2002
- U. Bringschulte, T. Ungerer: Microcontroller und Mikroprozessoren, Springer, Heidelberg, 2. Auflage 2007
- Theo Ungerer: Parallelrechner und parallele Programmierung, Spektrum-Verlag 1997

Course: Communication and Database Systems**Course key: [24574]****Lecturers:** Klemens Böhm, Martina Zitterbart**Credit points (CP):** 8 **Hours per week:** 4/2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Communication and Database Systems [IW3INKD] (S. 66)**Learning Control / Examinations****Prerequisites**

None.

Conditions

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

Learning Outcomes

The student

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

Content

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

Media

Slides.

Basic literature

- W. Stallings: Data and Computer Communications. Prentice Hall, 2006.
- S. Abeck, P. C. Lockemann, J. Seitz, J. Schiller: Verteilte Informationssysteme, dpunkt-Verlag, 1. Auflage, 2002, ISBN-13: 978-3898641883
- S. Abeck, P.C. Lockemann, J. Schiller, J. Seitz: Verteilte Informationssysteme. dpunkt-Verlag, 2003.
- Andreas Heuer, Kai-Uwe Sattler, Gunther Saake: Datenbanken — Konzepte und Sprachen, 3. Aufl., mitp-Verlag, Bonn, 2007
- Alfons Kemper, André Eickler: Datenbanksysteme. Eine Einführung, 6. Aufl., Oldenbourg Verlag, 2006

Complementary literature

- F. Halsall: Computer Networking and the Internet. Addison-Wesley, 2005.
- 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.
- J.F. Kurose, K.W. Ross: Computer Networking - A Top-Down Approach featuring the Internet, Addison-Wesley, 2007.

Course: Network Security: Architectures and Protocols**Course key: [24601]****Lecturers:** Marcus Schöller**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. [67](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

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 "Networksafety: 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 safety 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 safety protocols IPSec, TLS/SSL, and protocols of infrastructure security.

Media

Slides.

Basic literature

Roland Bless et al. Sichere Netzwerkkommunikation. Springer-Verlag, Heidelberg, Juni 2005.

Complementary 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. Demystifying 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: The Digital Library**Course key: [24603]****Lecturers:** Christoph-Hubert Schütte**Credit points (CP):** 3 **Hours per week:** 2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. 65)**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides.

Basic literature

None.

Complementary literature

Relevant publications will be mentioned in the lecture.

**Course: Datenschutz und Privatheit in vernetzten Informationssystemen
[24605]****Course key:****Lecturers:** Buchmann**Credit points (CP):** 3 **Hours per week:** 2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. [65](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**

Will be announced within the lecture slides.

Course: Algorithms for Planar Graphs**Course key: [24614]****Lecturers:** Dorothea Wagner**Credit points (CP):** 3 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. [69](#))**Learning Control / Examinations****Prerequisites****Conditions**

None.

Learning Outcomes**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.

Complementary literature

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

Course: Algorithms for Visualization of Graphs**Course key: [24621]****Lecturers:** Dorothea Wagner, Martin Nöllenburg**Credit points (CP):** 3 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. [69](#))**Learning Control / Examinations****Prerequisites**

Lecture *Algorithmentechnik* [24079] is recommended.

Conditions

None.

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 visualization algorithms is presented.

Media

Slides.

Complementary literature

- Di Battista, Eades, Tamassia, Tollis: Graph Drawing, Prentice Hall 1999
- Kaufmann, Wagner: Drawing Graphs, Springer-Verlag, 2001

Course: Fortgeschrittene Objektorientierung**Course key: [24639]****Lecturers:** Gregor Snelting**Credit points (CP):** 6 **Hours per week:** 3/2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Fortgeschrittene Objektorientierung [IW3INFOO] (S. [76](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Mobile Communication**Course key: [24643]****Lecturers:** Oliver Waldhorst**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. 67)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

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 Communication" 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 dispersion, modulation, and multiplexing are explained by application examples.

Media

Slides.

Basic literature

J. Schiller; Mobilkommunikation; Addison-Wesley, 2003.

Complementary literature

C. Eklund, R. Marks, K. Stanwood, S. Wang; IEEE Standard 802.16: A Technical Overview of the WirelessMAN-Advanced Air Interface for the Broadband Wireless Access; IEEE Communications Magazine, June 2002.

H. Kaaranen, A. Ahtinen, 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: Economics III: Introduction in Econometrics**Course key: [25016]****Lecturers:** Markus Höchstötter**Credit points (CP):** 5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Statistical Applications of Financial Risk Management [IW3VWL] (S. [54](#))**Learning Control / Examinations**

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

Prerequisites

statistics I + II

Conditions

None.

Learning Outcomes

Familiarity with the basic concepts and methods of econometrics

Preparation of simple econometric surveys

Content

Simple and multiple linear regression (estimating parameters, confidence interval, testing, prognosis, testing assumptions)

Multi equation models

Dynamic models

Basic literature

- 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

Complementary literature

Additional literature will be suggested in course

Course: Private and Social Insurance**Course key: [25050]****Lecturers:** Ute Werner, Heilmann, Besserer**Credit points (CP):** 2.5 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Insurance Management [IW3BWLFBV4] (S. [42](#))**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 every semester. Re-examinations are offered at every ordinary examination date.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary 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: Principles of Insurance Management**Course key: [25055]****Lecturers:** Ute Werner**Credit points (CP):** 4.5 **Hours per week:** 3/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Risk and Insurance Management [IW3BWLFBV3] (S. 41), Insurance Management [IW3BWLFBV4] (S. 42)**Learning Control / Examinations**

The assessment consists of an oral presentations (incl. elaboration) within the lecture (according to Section 4 (2), 3 of the examination regulation) and an oral exam at the end of the semester (according to Section 4 (2), 2 of the examination regulation). The overall grade consists of the valuation of the oral presentation incl. elaboration (50 percent) and the valuation of the oral exam (50 percent).

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Basic 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*.

Complementary literature

Will be announced in the lecture.

Remarks

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

This lecture will extraordinarily not be held in the winter term 2009/10.

Course: Seminar in Applied Informatics**Course key: [25070s]****Lecturers:** Andreas Oberweis, Hartmut Schmeck, Detlef Seese, Wolffried Stucky, Rudi Studer, Stefan Tai**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Semantic Web and Applications [IW3INAIFB3] (S. 60)**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.

Prerequisites

None.

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 learn during the seminar.
- present results of the research in written form generally found in scientific publications.

Content

The seminar intensifies and extends specific topics which are discussed within corresponding lectures. 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

Basic literature

Literature will be given individually.

Remarks

The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at <http://www.aifb.uni-karlsruhe.de/Lehre>

Course: Nonlinear Optimization I**Course key: [25111]****Lecturers:** Oliver Stein**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Methodical Foundations of OR [IW3OR6] (S. 56), Stochastic Methods and Simulation [IW3OR7] (S. 57)**Learning Control / Examinations**

The assessment consists of a written exam (60 minutes) according to Section 4(2), 1 of the examination regulation.

The exam takes place in the semester of the lecture and in the following semester.

The examination can also be combined with the examination of *Nonlinear Optimization II* [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 than 50% 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 than 50% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Prerequisites

None.

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 conditions 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.

Complementary 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**Course key: [25113]****Lecturers:** Oliver Stein**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Methodical Foundations of OR [IW3OR6] (S. 56)**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.

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 than 50% 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 than 50% of the computer exercise points, the grade of the passed exam is improved by a third of a grading step.

Prerequisites

None.

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.

Complementary 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: Global Optimization I**Course key: [25134]****Lecturers:** Oliver Stein**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Applications of Operations Research [IW3OR5] (S. 55), Methodical Foundations of OR [IW3OR6] (S. 56)**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.

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 than 50% 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 than 50% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Prerequisites

None.

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.

Complementary 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

Course key: [25136]

Lecturers: Oliver Stein

Credit points (CP): 4.5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: Applications of Operations Research [IW3OR5] (S. 55), Methodical Foundations of OR [IW3OR6] (S. 56)

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.

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 than 50% 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 than 50% of the computer exercise points, the grade of the passed examination is improved by a third of a grading step.

Prerequisites

None.

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 α BB 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.

Complementary 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: Marketing and Consumer Behavior**Course key: [25150]****Lecturers:** Wolfgang Gaul**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Foundations of Marketing [IW3BWL MAR] (S. [44](#))**Learning Control / Examinations****Prerequisites**

See corresponding module description.

Conditions

See corresponding module description.

Learning Outcomes**Content**

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

Basic literature

Further literature references are announced in the script.

Course: Modern Market Research**Course key: [25154]****Lecturers:** Wolfgang Gaul**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Foundations of Marketing [IW3BWL MAR] (S. [44](#))**Learning Control / Examinations**

See module description.

Prerequisites

Basic knowledge of statistics.

Conditions

None.

Learning Outcomes**Content****Basic literature**

Further literature references are announced in the script.

Course: Marketing and Operations Research**Course key: [25156]****Lecturers:** Wolfgang Gaul**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Foundations of Marketing [IW3BWLMAR] (S. [44](#))**Learning Control / Examinations****Prerequisites**

Basics of Operations Research are required.

Conditions

None.

Learning Outcomes**Content****Basic literature**

Will be announced in the lecture. Further literature references are announced in the script.

Course: Corporate Planning and Operations Research**Course key: [25158]****Lecturers:** Wolfgang Gaul**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Specialization in Customer Relationship Management [IW3BWLISM5] (S. [38](#))**Learning Control / Examinations**

See module description.

Prerequisites

Basics of operations research are assumed.

Conditions

None.

Learning Outcomes**Content****Basic literature**

Will be announced in the lecture. Further literature references are announced in the script.

Course: Brand Management**Course key: [25177]****Lecturers:** Bruno Neibecker**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Foundations of Marketing [IW3BWLMAR] (S. 44)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

(See description of the module)

Content

The students should learn the essential scientific and practical principles of Marketing, especially branding. Branding consists of any name, design, style, words or symbols, singly or in any combination that distinguish one product from another in the eyes of the consumer. Brand positioning, brand loyalty and brand equity are discussed as important elements of a management concept. The focus of the course is not limited to short-term ROI, but also long-term benefits of communication strategies facing company's responsibilities to all of its stakeholders, e.g. consumers, investors and public. The strategies and techniques in branding are broadened 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 accomplished with the analysis of several case studies. Within the limits of a knowledge based system for advertising evaluation many of the issues accomplished in the course are summarized. At the same time it is discussed as a tool to use marketing knowledge systematically.

Media

Slides, Powerpoint presentations, Website with Online Course Readings

Basic literature

- Aaker, J. L.: Dimensions of Brand Personality. In: Journal of Marketing Research 34, 1997, 347-356.
- BBDO-Düsseldorf (Hrsg.): Brand Equity Excellence. 2002.
- Bruhn, M. und GEM: Was ist eine Marke? Gräffelfing: 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: Bachelor Seminar in Foundations of Marketing**Course key: [25191]****Lecturers:** Wolfgang Gaul**Credit points (CP):** 3 **Hours per week:** 2/0**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. [31](#))**Learning Control / Examinations****Prerequisites**Knowledge like it is provided in the course *Foundations of Marketing* [WI3BWLMAR] is assumed.**Conditions**

None.

Learning Outcomes**Content**

Course: Management Accounting**Course key: [25210]****Lecturers:** Torsten Lüdecke**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Topics in Finance I [IW3BWLFBV5] (S. 40)**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.

Prerequisites

None.

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

Complementary 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: Financial Management**Course key: [25216]****Lecturers:** Martin E. Ruckes**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Essentials of Finance [IW3BWLFBV1] (S. 39)**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.

Prerequisites

None.

Conditions

None.

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

Complementary 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**Course key: [25232]****Lecturers:** Martin E. Ruckes**Credit points (CP):** 4.5 **Hours per week:** 3**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Topics in Finance I [IW3BWLFBV5] (S. 40)**Learning Control / Examinations****Prerequisites**

None.

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

Complementary literature

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

Course: Exchanges**Course key: [25296]****Lecturers:** Jörg Franke**Credit points (CP):** 1.5 **Hours per week:** 1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** eFinance [IW3BWLISM3] (S. [36](#)), Topics in Finance I [IW3BWLFBV5] (S. [40](#))**Learning Control / Examinations****Prerequisites**

None.

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 cooperative 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?

Complementary literature

Educational material will be offered within the lecture.

Course: Business Strategies of Banks**Course key: [25299]****Lecturers:** Wolfgang Müller**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Topics in Finance I [IW3BWLFBV5] (S. 40)**Learning Control / Examinations****Prerequisites**

None.

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.

Complementary literature

- A script is disseminated chapterwise within the lecture.
- Hartmann-Wendels, Thomas; Pfingsten, Andreas; Weber, Martin; 2000, Bankbetriebslehre, 2. Auflage, Springer

Course: Statistics and Econometrics in Business and Economics**Course key: [25325]****Lecturers:** Wolf-Dieter Heller**Credit points (CP):** 4.5 **Hours per week:** 2/2**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Statistical Applications of Financial Risk Management [IW3VWL] (S. [54](#))**Learning Control / Examinations****Prerequisites**

Basic knowledge in statistics is required.

Conditions

None

Learning Outcomes

statistically accurate use of financial market data, particularly time series analysis

Evaluation of various time series models and their applicability

Content

In Part 1 we will provide a thorough description of the quantitative part of investment theory paying attention to the mathematical, probabilistic and statistical methods now widely used in financial practice.

In Part 2 we shall study the methods of construction, identification and verification of the time-series models, which are among most powerful instruments of the financial econometrics. The emphasis will be on the financial and economic indicators forecasting the financial time-series.

Media

transparencies lecture

Basic literature

e.g.

- Franke/Härdle/Hafner : Einführung in die Statistik der Finanzmärkte.
- Ruppert: Statistics and Finance

Complementary literature

See reading list

Course: Bank Management and Financial Markets, Applied Econometrics [25355]**Course key:****Lecturers:** Karl-Heinz Vollmer**Credit points (CP):** 5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Statistical Applications of Financial Risk Management [IW3VWL] (S. [54](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Basic 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: Economics of Uncertainty**Course key: [25365]****Lecturers:** Karl-Martin Ehrhart**Credit points (CP):** 4.5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Strategic Games [IW3VWL4] (S. 51)**Learning Control / Examinations**

Written exam, possible further requirements.

Prerequisites

See corresponding module information.

Conditions

Knowledge in mathematics and statistics is required.

Learning Outcomes

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

Content

In the first part of the course we deal with problems of decision making under uncertainty and introduce models like expected utility theory, stochastic dominance, risk aversion, and prospect theory. We also consider the empirical validity of the different approaches.

In the second part the concepts learned in the first part are applied for example to search models and Bayesian games.

Media

overhead slides, possibly additional printed material.

Basic literature

- 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)

Complementary literature

- Lippman/McCall, Economics of Uncertainty, in: Handbook of Mathematical Economics I, 1986
- DeGroot, Optimal Statistical Decisions, Kap. 1 und 2, 1970

Course: Game Theory II**Course key: [25369]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 4.5 **Hours per week:** 2/2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Applied Game Theory [IW3VWL1] (S. 50), Strategic Games [IW3VWL4] (S. 51)**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.

Prerequisites

See corresponding module information.

Basic knowledge of mathematics and statistics is assumed.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Folien, Übungsblätter.

Basic literature

- Berninghaus/Ehrhart/Güth, Strategische Spiele, 2. Auflage, Springer Verlag, 2006
- van Damme, Stability and Perfection of Nash Equilibria, 2. Auflage, Springer Verlag, 1991

Complementary literature

- Aumann/Hart (eds.), Handbook of Game Theory I-III, Elsevier Publishers, North Holland, 1992/1994/2002

Course: Industrial Organization**Course key: [25371]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Applied Game Theory [IW3VWL1] (S. [50](#))**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.

Prerequisites

See corresponding module information.

Conditions

None.

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.

Basic literature

- H. Bester (2007), Theorie der Industrieökonomik. Berlin: Springer-Verlag

Complementary 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: Experimental Economics**Course key: [25373]****Lecturers:** Siegfried Berninghaus, Bleich**Credit points (CP):** 4,5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Applied Game Theory [IW3VWL1] (S. 50)**Learning Control / Examinations**

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

Prerequisites

See corresponding module information.

Conditions

None.

Learning Outcomes

The students should learn

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

Content

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

Media

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

Complementary literature

- Strategische Spiele; S. Berninghaus, K.-M. Ehrhart, W. Güth; Springer Verlag, 2nd ed., 2006.
- 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: Data Mining**Course key: [25375]****Lecturers:** Gholamreza Nakhaeizadeh**Credit points (CP):** 5 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Statistical Applications of Financial Risk Management [IW3VWL] (S. 54)**Learning Control / Examinations****Prerequisites**

None.

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

Basic 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). Hard-cover: 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: Facility Location and Strategic Supply Chain Management Course key: [25486]

Lecturers: Stefan Nickel

Credit points (CP): 4.5 **Hours per week:** 2/1

Term: Sommersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: Supply Chain Management [IW3BWLISM2] (S. 35), Applications of Operations Research [IW3OR5] (S. 55), Methodical Foundations of OR [IW3OR6] (S. 56)

Learning Control / Examinations

The assessment consist of a written exam (120 min) according to Section 4 (2), 1 of the examination regulation.

The exam takes place in every semester.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

Since the classical work "Theory of the Location of Industries" of Weber from 1909, the determination of an optimal location of a new facility with respect to existing customers is strongly connected to strategical logistics planning. Strategic decisions concerning the location of facilities as production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning allows an efficient flow of materials and leads to lower costs and increased customer service.

Subject of the course is an introduction to the most important terms and definitions in location planning as well as the presentation of basic quantitative location planning models. Furthermore, specialized location planning models for Supply Chain Management will be addressed as they are part in many commercial SCM tools for strategic planning tasks.

Complementary literature

- 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: Tactical and Operational Supply Chain Management**Course key: [25488]****Lecturers:** Stefan Nickel**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Applications of Operations Research [IW3OR5] (S. 55), Stochastic Methods and Simulation [IW3OR7] (S. 57)**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.

Prerequisites

Successful completion of the module *Introduction to Operations Research* [IW1OR].

Conditions

None.

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.

Complementary 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: Software Laboratory: OR Models I**Course key: [25490]****Lecturers:** Stefan Nickel**Credit points (CP):** 4.5 **Hours per week:** 1/2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Applications of Operations Research [IW3OR5] (S. 55)**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.

Prerequisites

Successful completion of the module *Operations Research* [WI1OR].

Conditions

None.

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: Welfare Economics**Course key: [25517]****Lecturers:** Clemens Puppe**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Microeconomic Theory [IW3VWL6] (S. [52](#))**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.

Prerequisites

The courses *Economics I: Microeconomics* [25012] and *Economics II: Macroeconomics* [25014] have to be completed beforehand.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

- J. Rawls: *A Theory of Justice*. Harvard University Press (1971)
- J. Roemer: *Theories of Distributive Justice*. Harvard University Press (1996)

Course: Game Theory I**Course key: [25525]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 4.5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Applied Game Theory [IW3VWL1] (S. 50), Strategic Games [IW3VWL4] (S. 51), Microeconomic Theory [IW3VWL6] (S. 52)**Learning Control / Examinations**

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

Prerequisites

Basic knowledge of mathematics and statistics is assumed.

See corresponding module information.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Folien, Übungsblätter.

Basic literature

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

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

Complementary literature

- Binmore, Fun and Games, DC Heath, Lexington, MA, 1991

Course: Advanced Microeconomic Theory**Course key: [25527]****Lecturers:** Clemens Puppe**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Microeconomic Theory [IW3VWL6] (S. [52](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Theory of Economic Growth**Course key: [25543]****Lecturers:** Marten Hillebrand**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Englisch**Part of the modules:** Macroeconomic Theory [IW3VWL8] (S. [53](#))**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.

Prerequisites

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 participant's interest.

Conditions

None.

Learning Outcomes**Content**

Course: Theory of Business Cycles**Course key: [25549]****Lecturers:** Marten Hillebrand**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Englisch**Part of the modules:** Macroeconomic Theory [IW3VWL8] (S. [53](#))**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.

Prerequisites

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 participant's interest.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

David Romer, *Advanced Macroeconomics*, 3rd edition, McGraw-Hill (2006)

Lutz Arnold: *Makroökonomik. Eine Einführung in die Theorie der Güter-, Arbeits- und Finanzmärkte* (2003)

Course: Simulation I**Course key: [25662]****Lecturers:** Karl-Heinz Waldmann**Credit points (CP):** 4.5 **Hours per week:** 2/1/2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Applications of Operations Research [IW3OR5] (S. 55), Stochastic Methods and Simulation [IW3OR7] (S. 57)**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).

Prerequisites

Foundations in the following fields are required:

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

Conditions

None.

Learning Outcomes

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

Content

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

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

Media

Blackboard, Slides, Flash Animations, Simulation Software

Basic literature

- Lecture Notes
- K.-H. Waldmann / U. M. Stocker: *Stochastische Modelle - Eine anwendungsorientierte Einführung*; Springer (2004).

Complementary 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**Course key: [25665]****Lecturers:** Karl-Heinz Waldmann**Credit points (CP):** 4.5 **Hours per week:** 2/1/2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Stochastic Methods and Simulation [IW3OR7] (S. 57)**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).

Prerequisites

Foundations in the following fields are required:

- Operations Research, as lectured in *Introduction to Operations Research I* [25040] and *Introduction to Operations Research II* [25043].
- Statistics, as lectured in *Statistics I* [25008/25009] and *Statistics II* [25020/25021].
- *Simulation I* [25662]

Conditions

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 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: Variance reduction techniques, simulation of stochastic processes, case studies.

Media

Blackboard, Slides, Flash Animations, Simulation Software

Basic literature

- Skript
- K.-H. Waldmann / U. M. Stocker: Stochastische Modelle - Eine anwendungsorientierte Einführung; Springer (2004).

Complementary 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: Markov Decision Models I**Course key: [25679]****Lecturers:** Karl-Heinz Waldmann**Credit points (CP):** 4.5 **Hours per week:** 2/1/2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Methodical Foundations of OR [IW3OR6] (S. 56), Stochastic Methods and Simulation [IW3OR7] (S. 57)**Learning Control / Examinations****Prerequisites**

None.

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

Basic literature

Lecture Notes

Complementary literature

Waldmann, K.H. , Stocker, U.M. (2004): Stochastische Modelle - eine anwendungsorientierte Einführung; Springer

Course: Efficient Algorithms

Course key: [25700]

Lecturers: Hartmut Schmeck

Credit points (CP): 5 **Hours per week:** 2/1

Term: Sommersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Algorithms and Applications [IW3INAIFB5] (S. 62)

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.

Prerequisites

credits for the Informatics modules of years 1 and 2.

Conditions

None.

Learning Outcomes

The student will learn how to use methods and concepts of efficient algorithms and how to demonstrate adequate innovative capabilities with respect to the used methods.

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

Content

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

Media

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

Basic 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)

Complementary literature

will be announced in class

Course: Special Topics of Efficient Algorithms**Course key: [25700sp]****Lecturers:** Hartmut Schmeck**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithms and Applications [IW3INAIFB5] (S. [62](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

Will be announced in the lecture.

Course: Algorithms for Internet Applications

Course key: [25702]

Lecturers: Hartmut Schmeck

Credit points (CP): 5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 4

Teaching language: Englisch

Part of the modules: Information Services in Networks [IW3INAIFB4] (S. 61), Algorithms and Applications [IW3INAIFB5] (S. 62)

Learning Control / Examinations

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

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

Prerequisites

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

Conditions

None.

Learning Outcomes

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

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

Content

Internet and World Wide Web are changing our world, this core course provides the necessary background and methods for the design of central applications of the Internet. After an introduction into Internet technology the following topics are addressed: information retrieval in the www, structure and functioning of search engines, foundations of secure communication, electronic payment systems and digital money, and - if time permits - security architectures (firewalls), data compression, distributed computing on the Internet.

Media

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

Basic literature

- 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.

Complementary literature

- Further references will be given in the course.

Course: Organic Computing**Course key: [25704]****Lecturers:** Hartmut Schmeck, Sanaz Mostaghim**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Englisch**Part of the modules:** Algorithms and Applications [IW3INAIFB5] (S. 62)**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.

Prerequisites

None.

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).

Basic 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.

Complementary 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: Nature-inspired Optimisation**Course key: [25706]****Lecturers:** Sanaz Mostaghim, Pradhyum Shukla**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithms and Applications [IW3INAIFB5] (S. [62](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Workflow-Management

Course key: [25726]

Lecturers: Andreas Oberweis

Credit points (CP): 5 **Hours per week:** 2/1

Term: Sommersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Business Process Engineering [IW3INAIFB6] (S. 63)

Learning Control / Examinations

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

Prerequisites

Knowledge of course *Applied Informatics I - Modelling* [25070] is expected.

Conditions

None.

Learning Outcomes

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

Content

A workflow is that part of a business process which is automatically executed by a computerized system. Workflow management includes the design, modelling, analysis, execution and management of workflows. Workflow management systems are standard software systems for the efficient control of processes in enterprises and organizations. Knowledge in the field of workflow management systems is especially important during the design of systems for process support.

The course covers the most important concepts of workflow management. Modelling and design techniques are presented and an overview about current workflow management systems is given. Standards, which have been proposed by the workflow management coalition (WfMC), are discussed. Petri nets are proposed as a formal modelling and analysis tool for business processes. Architecture and functionality of workflow management systems are discussed. The course is a combination of theoretical foundations of workflow management concepts and of practical application knowledge.

Media

Slides, Access to internet resources.

Basic literature

- 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

Complementary 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.

Course: Software Technology: Quality Management**Course key: [25730]****Lecturers:** Andreas Oberweis**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Business Processes and Information Systems [IW3INAIFB7] (S. [64](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides, access to internet resources.

Basic literature

- Helmut Balzert: Lehrbuch der Software-Technik. Spektrum-Verlag 1998
- Peter Liggesmeyer: Software-Qualität, Testen, Analysieren und Verifizieren von Software. Spektrum Akademischer Verlag 2002

Complementary literature

Further literature is given in lectures.

Course: Business Process Modelling**Course key: [25736]****Lecturers:** Andreas Oberweis, Marco Mevius**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Semantic Knowledge Management [IW3INAIFB2] (S. [59](#)), Business Process Engineering [IW3INAIFB6] (S. [63](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides, access to internet resources.

Basic literature

Literature will be given in the lecture.

Course: Knowledge Management**Course key: [25740]****Lecturers:** Rudi Studer**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Semantic Knowledge Management [IW3INAIFB2] (S. 59), Business Processes and Information Systems [IW3INAIFB7] (S. 64)**Learning Control / Examinations**

Written Examination (60 min) according to §4, Abs. 2, 1 of the examination regulations or oral examination of 20 minutes according to §4, Abs. 2, 2 of the examination regulations. The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites

Basics in logic, e.g. from lecture Foundations of Informatics 1.

Conditions

None.

Learning Outcomes

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

Content

In modern corporations, knowledge is an increasingly important aspect for fulfilling central tasks (amelioration of business processes, increasing innovation, increasing customer satisfaction, strategic planning and the like). Therefore, knowledge management has become a determining factor of success.

The lecture covers the different types of knowledge that play a role in knowledge management, the corresponding knowledge processes (generation, capture, access and usage of knowledge) as well as methodologies for the introduction of knowledge management solutions.

The lecture will further emphasize the following computer science techniques for knowledge management:

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

Media

Slides and scientific publications as reading material.

Basic literature

- 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 3-540-40834-7, Springer Verlag, 2004.
- 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

Complementary 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. Handschuh, Staab. Annotation for the Semantic Web. 2003 (ISBN 158603345X).
5. J. Sowa. Knowledge Representation. Brooks/Cole 1999
6. Tim Berners-Lee. Weaving the Web. Harper 1999 geb. 2000 Taschenbuch.

Course: Semantic Web Technologies I

Course key: [25748]

Lecturers: Rudi Studer, Sebastian Rudolph

Credit points (CP): 5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: Semantic Knowledge Management [IW3INAIFB2] (S. 59), Semantic Web and Applications [IW3INAIFB3] (S. 60), Information Services in Networks [IW3INAIFB4] (S. 61)

Learning Control / Examinations

The assessment consists of an 1h written exam following §4, Abs. 2, 1 of the examination regulation or of an oral exam (20 min) following §4, Abs. 2, 2 of the examination regulation.

The exam takes place every semester and can be repeated at every regular examination date.

Prerequisites

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

Conditions

None.

Learning Outcomes

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

Content

"Semantic Web" denotes an extension of the World Wide Web by meta data and applications in order to make the meaning (semantics) of data on the web usable by intelligent systems, e.g. in e-commerce and internet portals. Central to this is the representation and processing of knowledge in form of ontologies. This lecture provides the foundations for knowledge representation and processing for the corresponding technologies and presents example applications. It covers the following topics:

- Extensible Markup Language (XML)
- Resource Description Framework (RDF) and RDF Schema
- Web Ontology Language (OWL)
- Rule Languages
- Applications

Media

Slides.

Basic literature

- 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.

Complementary 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.

Course: Intelligent Systems in Finance**Course key: [25762]****Lecturers:** Detlef Seese**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** eFinance [IW3BWLISM3] (S. 36)**Learning Control / Examinations**

The assessment is a written examination.

See the German part for special requirements to be admitted for the examination.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

A new generation of computing methods, commonly known as "intelligent systems", has recently been successfully applied to a variety of business and financial modelling tasks. In many application fields these novel methods outperform traditional statistical techniques. The lecture provides a comprehensive coverage of the area, including foundations and applications. In particular it deals with intelligent software agents, genetic algorithms, neural networks, support vector machines, fuzzy-logic, expert systems and intelligent hybrid systems. The presented applications focus on the finance area and are related to risk management (credit risk, operational risk), financial trading, portfolio management and economic modelling. The lecture is given in cooperation with the company msgGILLARDON. The lecture starts with an introduction of the central problems of application in this area, e.g. decision support for investors, Portfolioselektion 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 chosen from the area of finance.

Media

Slides.

Basic 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 kernel-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 Finance Problems: A Survey of Selected Methods and Applications. In S. T. Rachev (Ed.) Handbook of Computational and Numerical Methods in Finance, Birkhäuser, Boston 2004, pp. 331 - 359.

Further references will be given in each lecture.

Complementary 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 content and schedule.

Course: Service Oriented Computing 1**Course key: [25770]****Lecturers:** Stefan Tai**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Web Information Systems [IW3INAIFB1] (S. 58), Business Process Engineering [IW3INAIFB6] (S. 63)**Learning Control / Examinations**

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

Prerequisites

Lecture A/2 [25033] is recommended.

Conditions

None.

Learning Outcomes

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

Content

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

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

Media

Slides, access to internet resources.

Basic literature

Will be announced in the lecture.

Course: Cloud Computing**Course key: [25776]****Lecturers:** Stefan Tai, Kunze**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Web Information Systems [IW3INAIFB1] (S. [58](#)), Information Services in Networks [IW3INAIFB4] (S. [61](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Enterprise Architecture Management**Course key: [25786]****Lecturers:** Thomas Wolf**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Business Processes and Information Systems [IW3INAIFB7] (S. [64](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides, access to internet resources.

Basic literature

- 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: Capability maturity models for software and systems engineering Course key: [25790]

Lecturers: Ralf Kneuper

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

Term: Sommersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Business Processes and Information Systems [IW3INAIFB7] (S. 64)

Learning Control / Examinations

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Preliminary Structure of the lecture:

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

Media

Slides, access to internet resources.

Basic literature

Literature is given in each lecture individually.

Course: Management and Strategy**Course key: [25900]****Lecturers:** Hagen Lindstädt**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Strategy and Organization [IW3BWLÜO1] (S. 45)**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

The participants learn about central concepts of strategic management along the ideal-typical strategy process: internal and external strategic analysis, concept and sources of competitive advantages, their importance when establishing competitive and corporate strategies as well as strategy assessment and implementation. This aims in particular to provide a summary of the basic concepts and models of strategic management, i.e. to provide in particular an action-oriented integration.

Content

- Corporate management principles
- Strategic management principles
- Strategic analysis
- Competitive strategy: modelling and selection on a divisional level
- Strategies for oligopolies and networks: anticipation of dependencies
- Corporate strategy: modelling and evaluation on a corporate level
- Strategy implementation

Media

Slides.

Basic literature

- 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: Managing Organizations**Course key: [25902]****Lecturers:** Hagen Lindstädt**Credit points (CP):** 4 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Strategy and Organization [IW3BWL01] (S. [45](#))**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.

Prerequisites

None.

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.

Basic literature

- Kieser, A.; Walgenbach, P.: *Organisation*. Schäffer-Poeschel, 4. Aufl. Stuttgart 2003.
- Robey, D.; Sales, C.A.: *Designing Organizations*, McGraw-Hill. 4. Aufl. Boston 1994.
- Scholz, C.: *Strategische Organisation*. 2. Aufl. Landsberg/Lech 2000.
- Staehle, W.H.: *Management*. Vahlen, 8. Aufl. München 1999.

The relevant excerpts and additional sources are made known during the course.

Course: Special Topics in Management: Management and IT**Course key: [25907]****Lecturers:** Hagen Lindstädt**Credit points (CP):** 2 **Hours per week:** 1/0**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Strategy and Organization [IW3BWLÜO1] (S. [45](#))**Learning Control / Examinations**

The assessment consists of a written exam (30 min) at the beginning of the recess period (according to Section 4(2), 1 of the examination regulation).

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

(Excerpt):

- A summary of current management concepts and questions.

Media

Slides.

Basic literature

The relevant excerpts and additional sources are made known during the course.

Course: Seminar: Management and Organization**Course key: [25915]****Lecturers:** Hagen Lindstädt**Credit points (CP):** 3 **Hours per week:** 2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. [31](#))**Learning Control / Examinations****Prerequisites**

See corresponding module information.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides.

Basic literature

The relevant sources are made known during the course.

Course: Seminar: Management and Organization**Course key: [25916]****Lecturers:** Hagen Lindstädt**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. [31](#))**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides.

Basic literature

The relevant sources are made known during the course.

Course: Fundamentals of Production Management**Course key: [25950]****Lecturers:** Frank Schultmann**Credit points (CP):** 5.5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Industrial Production I [IW3BWLIP1] (S. [47](#))**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Media will be provided on learning platform.

Basic literature

will be announced in the course

Course: Energy Policy**Course key: [25959]****Lecturers:** Martin Wietschel**Credit points (CP):** 3.5 **Hours per week:** 2/0**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Energy Economics [IW3BWLIIIP2] (S. [46](#))**Learning Control / Examinations****Prerequisites**

Keine.

Conditions

Keine.

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.

Basic literature

Will be announced in the lecture.

Course: Material and Energy Flows in the Economy**Course key: [25960]****Lecturers:** Michael Hiete**Credit points (CP):** 3.5 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Industrial Production I [IW3BWLIP1] (S. [47](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**

will be announced in the course

Course: Logistics and Supply Chain Management**Course key: [25996]****Lecturers:** Frank Schultmann**Credit points (CP):** 3.5 **Hours per week:** 2/0**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Industrial Production I [IW3BWLIP1] (S. [47](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Introduction in to Energy Economics**Course key: [26010]****Lecturers:** Wolf Fichtner**Credit points (CP):** 5.5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Energy Economics [IW3BWLIIIP2] (S. [46](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

See module description.

Content**Media**

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

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

Lecturers: Wolf Fichtner

Credit points (CP): 3.5 **Hours per week:** 2/0

Term: Wintersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Energy Economics [IW3BWLIIIP2] (S. [46](#))

Learning Control / Examinations

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

See module description.

Content**Media**

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

Course: Competition in Networks**Course key: [26240]****Lecturers:** Kay Mitusch**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Specialization in Customer Relationship Management [IW3BWLISM5] (S. 38)**Learning Control / Examinations****Prerequisites**

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

Conditions

None.

Learning Outcomes

The lecture provides the students with the basic economic understanding of network industries like telecom, utilities, IT and transport sectors.

Students are prepared for a possible job in the network industries. The student should get a vivid idea of the special characteristics of network industries concerning planning, competition, competitive distortion and state intervention. He should be able to apply abstract concepts and formal methods to use in these fields.

Content

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

Basic literature

Will be announced in the lecture.

Remarks

Beginning in WT 2009/2010, the lecture *Competition in Networks* [26240] will always be held during the winter term.

Course: Insurance Models**Course key: [26300]****Lecturers:** Christian Hipp**Credit points (CP):** 5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Insurance: Calculation and Control [IW3BWLFBV2] (S. [43](#))**Learning Control / Examinations**

See module description.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

- Versicherungsbetriebslehre: Das Risiko und seine Kalkulation. Studienhefte 21, 22, 23. gabler Studentexte
- Gerber: An Introduction to mathematical Risk Theory. Huebner Foundation Monograph 8, Wharton School.

Course: Insurance Marketing**Course key: [26323]****Lecturers:** Ute Werner**Credit points (CP):** 4.5 **Hours per week:** 3/0**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Insurance Management [IW3BWLFBV4] (S. [42](#))**Learning Control / Examinations**

The assessment consists of an oral exam (according to Section 4 (2), 2 of the examination regulation) and oral presentations within the lecture (according to Section 4 (2), 3 of the examination regulation).

The overall grade consists of the valuation of the oral presentations (incl. elaboration) and the valuation of the oral exam.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary 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 irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

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

Course: Enterprise Risk Management**Course key: [26326]****Lecturers:** Ute Werner**Credit points (CP):** 4.5 **Hours per week:** 3/0**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Risk and Insurance Management [IW3BWLFBV3] (S. 41)**Learning Control / Examinations**

The assessment consists of an oral presentations within the lecture (according to Section 4 (2), 3 of the examination regulation) and an oral exam (according to Section 4 (2), 2 of the examination regulation).

The overall grade consists of the valuation of the oral presentation and the valuation of the oral exam.

Prerequisites

None.

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 optimization approaches that allow to consider area-specific objectives, risk-bearing capacity and risk acceptance.

Content

1. Concepts and practice of risk management, based on decision theory
2. Goals, strategies and measures 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.

Basic 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.

Remarks

This course is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>
To attend the course please register at the secretariat of the chair of insurance science.

Course: Insurance Contract Law**Course key: [26360]****Lecturers:** Ute Werner, Schwebler**Credit points (CP):** 4.5 **Hours per week:** 3/0**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Insurance Management [IW3BWLFBV4] (S. [42](#))**Learning Control / Examinations**

The assessment consists of an oral or a written exam (according to Section 4 (2), 1 of the examination regulation).

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

Römer/ Langheid. Versicherungsvertragsgesetz. 2. Auflage, München 2002. Schimikowski, Versicherungsvertragsrecht, 3. Auflage, München 2004. Weyers/ Wandt, Versicherungsvertragsrecht, 3. Auflage, Köln 2003.

Remarks

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

The course is offered extraordinarily in winter term 2009/10.

Course: Insurance Game**Course key: [26372]****Lecturers:** Christian Hipp**Credit points (CP):** 4 **Hours per week:** 2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Insurance: Calculation and Control [IW3BWLFBV2] (S. [43](#))**Learning Control / Examinations**

See module description.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**

- Ingame: Das Unternehmensplanspiel Versicherungen, Lehrstuhl für Versicherungswirtschaft, FBV, Uni Karlsruhe
- Zweifel, Eisen: Versicherungsökonomie, 2000, Kapitel 1, 2 und 5
- Aktuelle Ausgaben der Zeitschrift „Versicherungswirtschaft“

Course: Real Estate Management II**Course key: [26400]****Lecturers:** Thomas Lützkendorf**Credit points (CP):** 4,5 **Hours per week:** 2/2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Real Estate Management [WW3BWLOOW2] (S. [49](#))**Learning Control / Examinations**

The assessment consists of a written exam (60 min) or an oral exam (20 min.) according to Section 4 (2), 1 or 2 of the examination regulation.

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

Prerequisites

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Conditions

None.

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.

Complementary literature

See german version.

Remarks

The course is replenished by excursions and guest lectures by practitioners out of the real estate business.

Course: Real Estate Management I**Course key: [26400w]****Lecturers:** Thomas Lützkendorf**Credit points (CP):** 4,5 **Hours per week:** 2/2**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Real Estate Management [WW3BWLOOW2] (S. 49)**Learning Control / Examinations**

The assessment consists of a written exam (60 min) or an oral exam (20 min.) according to Section 4 (2), 1 or 2 of the examination regulation.

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

Prerequisites

A combination with the module *Design Construction and Assessment of Green Buildings I* [WW3BWLOOW1] is recommended.

Furthermore it is recommended to choose courses of the following fields

- Finance and Banking
- Insurance
- Civil Engineering and Architecture (building physics, structural design, facility management)

Conditions

None.

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 throughout its lifecycle. Among other topics this includes project development, location and market studies, German federal building codes as well as finance and assessment of economic efficiency.

The tutorial recesses the contents of the course by means of practical examples and, in addition to that, goes into the possible use of software tools.

Media

Presentation slides and supplementary material is provided partly as printout, partly online for download.

Complementary 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 practitioners out of the real estate business.

Course: Sustainability Assessment of Construction Works**Course key: [26404]****Lecturers:** Thomas Lützkendorf**Credit points (CP):** 4,5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Sustainable Construction [WW3BWLOOW1] (S. 48)**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.

Prerequisites

A combination with the module *Real Estate Management* [WW3BWLOOW2] and with engineering science modules from the areas building physics and structural design is recommended.

Conditions

None.

Learning Outcomes

Knowledge in the area of economic and environmental assessment 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.

Complementary literature

See German version.

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

Lecturers: Thomas Lützkendorf

Credit points (CP): 4,5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Sustainable Construction [WW3BWLOOW1] (S. 48)

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.

Prerequisites

None.

Conditions

A combination with the module *Real Estate Management* [IW3BWLWO1] 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.

Complementary literature

See german version.

Course: Management of Business Networks**Course key: [26452]****Lecturers:** Christof Weinhardt, Jan Kraemer**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Englisch**Part of the modules:** eBusiness and Servicemanagement [IW3BWLISM1] (S. 34), Supply Chain Management [IW3BWLISM2] (S. 35)**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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

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

Basic literature

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

Lecturers: Christof Weinhardt, Ryan Riordan

Credit points (CP): 4.5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: eBusiness and Servicemanagement [IW3BWLISM1] (S. 34), eFinance [IW3BWLISM3] (S. 36), Topics in Finance I [IW3BWLFBV5] (S. 40)

Learning Control / Examinations

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Powerpoint presentations, recorded lecture available on the internet

Basic literature

- Picot, Arnold, Christine Bortenlänger, Heiner Röhl (1996): "Börsen im Wandel". Knapp, Frankfurt
- Harris, Larry (2003): "Trading and Exchanges - Market Microstructure for Practitioners". Oxford University Press, New York

Complementary 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: eServices**Course key: [26466]****Lecturers:** Christof Weinhardt, Gerhard Satzger**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Englisch**Part of the modules:** eBusiness and Servicemanagement [IW3BWLISM1] (S. 34), Specialization in Customer Relationship Management [IW3BWLISM5] (S. 38)**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

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

Content

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

Building on a systematic categorization of (e)Services, we cover concepts and foundations for engineering and managing IT-based services, allowing further specialization in subsequent courses. Topics include service innovation, service economics, service computing, transformation and coordination of service value networks as well as collaboration for knowledge intensive services. In addition, application examples, guest lectures (e.g. business model changes driven by the advent of eServices) and a number of hands-on exercises will illustrate the applicability of the concepts.

Media

PowerPoint slides;

Course: Special Topics in Information Engineering & Management **Course key: [26478]**

Lecturers: Christof Weinhardt

Credit points (CP): 4.5 **Hours per week:** 3

Term: Winter-/Sommersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: eBusiness and Servicemanagement [IW3BWLISM1] (S. 34)

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.

Prerequisites

None.

Conditions

None.

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 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 further 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 encompasses a documentation of the implemented work.

Media

- Power Point
- eLearning Plattform Ilias
- Software tools for development , if needed

Basic literature

The basic literature will be made available to the student according to the respective 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: <http://www.im.uni-karlsruhe.de/lehre>.

This lecture is first offered in the winter term 2009/10.

Course: Customer Relationship Management

Course key: [26508]

Lecturers: Andreas Geyer-Schulz

Credit points (CP): 4,5 **Hours per week:** 2/1

Term: Wintersemester **Level:** 4

Teaching language: Englisch

Part of the modules: CRM and Service Management [IW3BWLISM4] (S. 37)

Learning Control / Examinations

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

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

The students

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

Content

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

Media

Slides

Basic literature

Christian Grönroos. Service Management and Marketing : A Customer Relationship Management Approach. Wiley, Chichester, 2nd edition, 2000.

Complementary 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 Relationship Technologies. Prentice Hall, Upper Saddle River, 2001.

Stanley A. Brown. Customer Relationship Management: A Strategic Imperative in the World of E-Business. John Wiley, Toronto, 2000.

Course: Operative CRM**Course key: [26520]****Lecturers:** Andreas Geyer-Schulz**Credit points (CP):** 4,5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** CRM and Service Management [IW3BWLISM4] (S. 37), Specialization in Customer Relationship Management [IW3BWLISM5] (S. 38)**Learning Control / Examinations**

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

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

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

Prerequisites

None.

Conditions

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

Learning Outcomes

The Student

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

Content

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

Basic literature

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 Relationship Technologies*. Prentice Hall, Upper Saddle River, 2001.

Complementary 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 the World of E-Business*. John Wiley, Toronto, 2000.

Dimitris N. Chorafas. *Integrating ERP, CRM, Supply Chain Management, and Smart Materials*. 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: Analytical CRM**Course key: [26522]****Lecturers:** Andreas Geyer-Schulz**Credit points (CP):** 4,5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** CRM and Service Management [IW3BWLISM4] (S. 37), Specialization in Customer Relationship Management [IW3BWLISM5] (S. 38)**Learning Control / Examinations**

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

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

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

Prerequisites

None.

Conditions

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

Learning Outcomes

The Student should

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

Content

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

Media

slides

Basic literature

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: Bachelor Seminar in Information Engineering and Management [26524]

Course key:

Lecturers: Andreas Geyer-Schulz

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

Term: Winter-/Sommersemester **Level:** 3

Teaching language: Deutsch

Part of the modules: Seminar Module Economic Sciences [IW3SEMWIWI] (S. 31)

Learning Control / Examinations

Prerequisites

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

Conditions

None.

Learning Outcomes

The student is able to

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

Content

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

The seminar treats questions of Customer Relationship Management.

Basic literature

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

Complementary literature

- 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: Derivatives**Course key: [26550]****Lecturers:** Marliese Uhrig-Homburg**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** eFinance [IW3BWLISM3] (S. [36](#)), Topics in Finance I [IW3BWLFBV5] (S. [40](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

Content

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

Media

Slides, Exercises/Exercise sheets

Basic literature

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

Complementary literature

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

Course: International Finance**Course key: [26570]****Lecturers:** Marliese Uhrig-Homburg, Walter**Credit points (CP):** 3 **Hours per week:** 2**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** eFinance [IW3BWLISM3] (S. [36](#)), Topics in Finance I [IW3BWLFBV5] (S. [40](#))**Learning Control / Examinations****Prerequisites**

None.

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.

Complementary literature

- D. Eiteman et al. (2004): Multinational Business Finance, 10. Auflage

Course: Investments**Course key: [26575]****Lecturers:** Marliese Uhrig-Homburg**Credit points (CP):** 4.5 **Hours per week:** 2/1**Term:** Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Essentials of Finance [IW3BWLFBV1] (S. 39)**Learning Control / Examinations**

The assessment consists of a written exam (75 min) according to Section 4(2), 1 of the examination regulation.

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

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

Complementary literature

Bodie/Kane/Marcus (2001): Essentials of Investments, 4. Aufl., McGraw-Hill Irwin, Boston

Course: Seminar in Financial Engineering**Course key: [26580]****Lecturers:** Marliese Uhrig-Homburg**Credit points (CP):** 3 **Hours per week:** 2**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. [31](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

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

Content

Changing current topics complementing the lectures' contents.

Media

Aktuelle wissenschaftliche Artikel.

Basic literature

wird jeweils zu den einzelnen Seminarthemen angegeben

Complementary literature

Über die beim Seminar angegebene Einstiegsliteratur hinaus ist eigenständige Literaturrecherche erforderlich.

Course: Algorithmic Methods for Hard Optimization Problems**Course key: [AlgoMO]****Lecturers:** Dorothea Wagner, Peter Sanders**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. [69](#))**Learning Control / Examinations****Prerequisites**Lecture *Algorithmentechnik* [24079] is recommended.**Conditions**

None.

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 reasonable amount of time. An example is the "bin packing problem" where a collection of objects must be packed using a possibly small number of bins. Moreover, problems sometimes arise where knowledge about the future (or even about the present) is incomplete, but a decision is required nevertheless ("online problems"). Regarding bin packing, for example, there must be a point in time when you close the bins and send them away. Even if there are some more objects arriving later.

Course: Praxis des Lösungsvertriebs**Course key: [PLV]****Lecturers:** Klemens Böhm, Hellriegel**Credit points (CP):** 1 **Hours per week:** 2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. [65](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Complementary literature**

Reiner Czichos: Creaktives Account-Management.

Course: Projektmanagement aus der Praxis**Course key: [PMP]****Lecturers:** Klemens Böhm, Schnober**Credit points (CP):** 1 **Hours per week:** 2**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. [65](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Programmierparadigmen**Course key: [PPD]****Lecturers:** Gregor Snelting, Ralf Reussner**Credit points (CP):** 6 **Hours per week:** 3/1**Term:** Wintersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Programmierparadigmen [IW3IWPROGP] (S. [75](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Praxis der Unternehmensberatung**Course key: [PUB]****Lecturers:** Klemens Böhm, Dürr**Credit points (CP):** 1 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. [65](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Praxis der Telematik**Course key: [PXT]****Lecturers:** Martina Zitterbart**Credit points (CP):** 2 **Hours per week:** 1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. [67](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Basic literature**S. Keshav. *An Engineering Approach to Computer Networking*. Addison-Wesley, 1997J.F. Kurose, K.W. Ross. *Computer Networking: A Top-Down Approach Featuring the Internet*. 4rd Edition, Addison-Wesley, 2007W. Stallings. *Data and Computer Communications*. 8th Edition, Prentice Hall, 2006**Complementary 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: Computing Lab Information Systems**Course key: [PraBI]****Lecturers:** Andreas Oberweis, Detlef Seese, Wolffried Stucky, Rudi Studer**Credit points (CP):** 5 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Business Process Engineering [IW3INAIFB6] (S. 63)**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

Students are able to

- implement a prototype at the computer based on the given topic.
- write the thesis with a minimal learning curve by using format requirements such as those recommended by well-known publishers.
- give presentations in a scientific context in front of an auditorium. These techniques are presented and learn during the course.
- present results of the research in written form generally found in scientific publications.

Content

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

Media

Slides, Access to internet resources

Basic literature

Literature will be given individually.

Remarks

The title of this course is a generic one. Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at <http://www.aifb.uni-karlsruhe.de/Lehre>

Course: Praktikum Advanced Telematics**Course key: [PrakATM]****Lecturers:** Martina Zitterbart**Credit points (CP):** 5 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Telematics [IW3INTM] (S. [67](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Special Topics of Enterprise Information Systems**Course key: [SBI]****Lecturers:** Andreas Oberweis, Wolffried Stucky**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Winter-/Sommersemester **Level:** ???**Teaching language:** Deutsch**Part of the modules:** Business Processes and Information Systems [IW3INAIFB7] (S. [64](#))**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

Students 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.

Basic literature

Will be announced at the beginning of the course.

Course: Software Engineering II**Course key: [SWT2]****Lecturers:** Ralf Reussner, Walter F. Tichy**Credit points (CP):** 6 **Hours per week:** 3/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Softwaretechnik II [IW3INSWT2] (S. [74](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Seminar in Enterprise Information Systems**Course key: [SemAIFB1]****Lecturers:** Rudi Studer, Andreas Oberweis, Wolffried Stucky, Thomas Wolf, Ralf Kneuper**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Informatics [IW3SEMINFO] (S. 30), Business Processes and Information Systems [IW3INAIFB7] (S. 64)**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.

Prerequisites

See corresponding module information.

Conditions

None.

Learning Outcomes

Students are able to

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

Content

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

Specific titles and the topics of offered seminars will be announced before the start of a semester in the internet at <http://www.aifb.uni-karlsruhe.de/Lehre>

Basic literature

Literature will be given individually in the specific seminar.

Course: Seminar Knowledge Management

Course key: [SemAIFB4]

Lecturers: Rudi Studer

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

Term: Wintersemester **Level:** 4

Teaching language: Deutsch

Part of the modules: Seminar Module Informatics [IW3SEMINFO] (S. 30)

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.

Prerequisites

See module description.

Conditions

None.

Learning Outcomes

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

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

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

Content

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

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

Media

Slides.

Basic literature

- 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.)

Complementary literature

None.

Remarks

The number of students is limited. Students have to observe the designated registration process.

Course: Seminar in Industrial Production**Course key: [SemIIP2]****Lecturers:** Frank Schultmann, Magnus Fröhling, Michael Hiete**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. [31](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Seminar Information Engineering and Management**Course key: [SemiIW]****Lecturers:** Christof Weinhardt**Credit points (CP):** 3,5 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIW] (S. 31)**Learning Control / Examinations**

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

Prerequisites

See corresponding module information.

Conditions

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

Learning Outcomes

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

Content

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

Media

- Powerpoint,
- eLearning Platform Ilias
- Software Tools, if necessary

Basic literature

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

Remarks

- Students from Bachelor and Master Course can visit the seminar. The research topic as well as the evaluation of the work and the presentation will have a different focus between Bachelor and Master Course.
- All the seminars offered at the chair of Prof. Dr. Weinhardt can be chosen. The current topics of the seminars are available at the following homepage: <http://www.im.uni-karlsruhe.de/lehre>.

Course: Seminar in Experimental Economics**Course key: [SemWIOR3]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWIWI] (S. 31)**Learning Control / Examinations**

Term paper and presentation

Prerequisites

See corresponding module information.

A course in the field of Game Theory should be attended beforehand.

Conditions

None.

Learning Outcomes

The seminar wants to deepen the methods of scientific work. Students shall learn to discuss critical the latest research results in Experimental Economics.

Students learn the technical basics of presentation and to argument scientifically. Also rethoric skills shall be amplified.

ContentThe seminar's topic will be announced before the beginning of each semester on the internet (http://www.wior.uni-karlsruhe.de/LS_Berninghaus/Studium/).**Media**

Slides.

Basic literature

Will be announced at the end of the recess period.

Course: Seminar in Game and Decision Theory**Course key: [SemWIOR4]****Lecturers:** Siegfried Berninghaus**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Seminar Module Economic Sciences [IW3SEMWiWi] (S. 31)**Learning Control / Examinations**

Term paper and presentation

Prerequisites

Completion of all 1st and 2nd year modules of the Bachelor Program.

See corresponding module information.

Conditions

None.

Learning Outcomes

The seminar wants to deepen the methods of scientific work. Students shall learn to discuss critical the latest research results in game theory.

Procurement of SQs: Students learn the technical basics of presentation and to argument scientifically. Also rethoric skills shall be amplified.

ContentThe seminar's topic will be announced before the beginning of each semester on the internet (http://www.wior.uni-karlsruhe.de/LS_Berninghaus/Studium/).**Media**

Slides.

Basic literature

Will be announced at the end of the recess period.

Course: Deployment of Database Systems**Course key: [dbe]****Lecturers:** Klemens Böhm**Credit points (CP):** 5 **Hours per week:** 2/1**Term:** Wintersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Grundlagen von Informationssystemen [IW3INGIS] (S. 65)**Learning Control / Examinations**

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

Prerequisites

Knowledge about database systems, e.g., from the lecture "Communications and Database Systems".

Conditions

None.

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.

Basic 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.

Complementary 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: Seminar in Law**Course key: [rechtsem]****Lecturers:** Thomas Dreier, Peter Sester, Indra Spiecker genannt Döhmann**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Law [IW3SEMJURA] (S. 32)**Learning Control / Examinations**

Written paper and oral presentation (§4, Abs. 2, 3 of the SPO).

Prerequisites

None.

Conditions

None.

Learning Outcomes

It is the goal of the seminar to enable students to independent scientific research regarding legal issues in the area of information management and engineering. The seminar covers legal issues of information law and commercial law, from internet law, the law of intellectual property, competition law and data protection law to contract law. The subjects to be discussed comprise issues of national, European and international law. Written papers shall also discuss the information technology issues and economic questions related to the legal problem at issue.

Content

The seminar covers legal issues of information law, from internet law, the law of intellectual property, competition law and data protection law to contract law. The subjects to be discussed comprise issues of national, European and international law. Each seminar focuses on a different set of issues. Written papers shall also discuss the information technology issues and economic questions related to the legal problem at issue. The current topics will be announced before start of term.

Students can participate in all seminars offered by the ZAR/IIR (however, students can participate in seminars of the master study cours, seminars in cooperation with the University of Freiburg and other specially marked seminars if special permission has been granted).

Basic literature

Tba in the lecture.

Course: Sicherheit**Course key: [sich]****Lecturers:** Jörn Müller-Quade**Credit points (CP):** 6 **Hours per week:** 3/1**Term:** Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Security [IW3INSICH] (S. [71](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content**

Course: Algorithm Engineering**Course key: [xAlgoEng]****Lecturers:** Peter Sanders, Dorothea Wagner**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. 69)**Learning Control / Examinations****Prerequisites**Lecture *Algorithmentchnik***Conditions**

None.

Learning Outcomes

The students come to know the methodology of algorithm engineering. Moreover, examples of well done algorithm engineering are presented.

Content

- What is algorithm engineering, why is it interesting, ...?
- Realistic models of machines and applications
- Practice-oriented design of algorithms
- Implementation techniques
- Experimental methods
- Analysis of measured data

The above skills are taught using concrete examples. In the past the following topics from the area of fundamental algorithms and data structures have been used for example:

- linked lists without special cases
- Sorting: parallel, external, superscalar,...
- Priority queues (cache efficiency,...)
- Search trees for integer keys
- Full-text indexing
- Graph algorithms: minimum spanning trees (external,...), route planning

The best practical and theoretical techniques known are considered. In most cases, these techniques are very different from the methods taught in a beginner's course.

Media

Slides, Scriptum, papers, source codes

Complementary literature

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

Remarks

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

Course: Practical Course Information Services in Networks**Course key: [xIDLp]****Lecturers:** Hartmut Schmeck, Stefan Tai, Wilfried Juling, Walter F. Tichy, Rudi Studer, Hannes Hartenstein**Credit points (CP):** 4 **Hours per week:** 4**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Information Services in Networks [IW3INAIFB4] (S. 61)**Learning Control / Examinations****Prerequisites**

None.

Conditions

the advanced lab may offered by any of the lecturers participating in this module

Learning Outcomes

Students can,

- carry out a literature search based on a given topic, and then identify, find, evaluate and analyze the relevant literature.
- produce their seminar work (and later the bachelor- / masters thesis) without much initial delay for familiarizing with the topic, while obeying format requirements, like the ones provided by publishers in the publication of documents.
- devise presentations as part of a scientific context. For that techniques will be presented which allow the preparation and presentation of the content to be presented in a manner that is adequate for the audience.
- present the results of the research in written form in a manner that is generally used in scientific publications.

Content

The seminar deals with specific topics that were partly mentioned in the respective lecture, and deepens them. A previous visit to the respective lecture is helpful, but not a prerequisite for attendance.

Course: Seminar Information Services in Networks**Course key: [xIDLs]****Lecturers:** Hartmut Schmeck, Stefan Tai, Wilfried Juling, Rudi Studer, Hannes Hartenstein, Walter F. Tichy**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 3**Teaching language:** Deutsch**Part of the modules:** Seminar Module Informatics [IW3SEMINFO] (S. [30](#))**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes

Students can,

- carry out a literature search based on a given topic, and then identify, find, evaluate and analyze the relevant literature.
- produce their seminar work (and later the bachelor- / masters thesis) without much initial delay for familiarizing with the topic, while obeying format requirements, like the ones provided by publishers in the publication of documents.
- devise presentations as part of a scientific context. For that techniques will be presented which allow the preparation and presentation of the content to be presented in a manner that is adequate for the audience.
- present the results of the research in written form in a manner that is generally used in scientific publications.

Content

The seminar deals with specific topics that were partly mentioned in the respective lecture, and deepens them. A previous visit to the respective lecture is helpful, but not a prerequisite for attendance.

Course: Parallel Algorithms**Course key: [xParallAlgo]****Lecturers:** Peter Sanders**Credit points (CP):** 3 **Hours per week:** 2**Term:** Winter-/Sommersemester **Level:** 4**Teaching language:** Deutsch**Part of the modules:** Algorithm Design [IW3INALGT] (S. 69)**Learning Control / Examinations****Prerequisites**Knowledge from lecture *Algorithmentechnik* is required.**Conditions**

None.

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

Complementary 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

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

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.

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II. Bachelorprüfung

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Die Universität Karlsruhe (TH) hat sich im Rahmen der Umsetzung des Bolognaprozesses zum Aufbau eines Europäischen Hochschulraumes zum Ziel gesetzt, dass am Abschluss der Studiendenausbildung 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.

§ 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		<i>nicht bestanden</i> (failed) - es sind Verbesserungen erforderlich, bevor die Leistungen anerkannt werden,
F		<i>nicht bestanden</i> (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.

§ 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.

(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.

(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 Bachelorgades 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.

§ 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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