



Karlsruher Institut für Technologie

Information Engineering and Management (M.Sc.)

Summer Term 2015
Short version SPO 2009
26.02.2015

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Department of Informatics



Publishers:



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1 Structure of the Master Programme in Information Engineering and Management

The Master programme in *Information Engineering and Management* has 4 terms. The terms 1 to 3 of the programme are method-oriented and provide the students with state-of-the-art knowledge in informatics, business administration, operations research, economics, statistics and law. The interdisciplinary approach is especially emphasized in the interdisciplinary seminar.

It is recommended to study the courses in the following sequence:

- The (mandatory) modules in business administration and operations research should be studied in the first two terms of the programme.
- The interdisciplinary seminar module should be taken until the end of the third term of the programme.
- The (elective) modules from business administration, economics, operations research, and statistics, from informatics, and from law should be studied in the first three terms of the programme.
- The 4-th term is reserved for the Master Thesis in which the student proves his ability for independent scientific research in informatics, the economic sciences, and law.

Figure 1 shows a summary of this recommendation with the structure of the disciplines and with credit points allocated to the modules of the programme.

Information Engineering and Management (M.Sc.)											
Semester	INFO*				BA/EC/OR/STAT*			LAW*		Interdisciplinary seminar module	
Subject	Elective				Compulsory	Elective		Elective			
1					BA 10 CP	OR 5 CP	BA 9 CP	BA/EC/ OR/STAT 9 CP	Law 9 CP	Law 9 CP	6 CP
2	INFO 8 CP	INFO 8 CP	INFO 8 CP	INFO 9 CP							
3											
4	Master Thesis 30 CP										
120 CP (Compulsory modules+ elective modules + Master thesis)											

*: The amount of credit points for the modules shown in the figure are only examples. In the elective field of „Informatics“ 33 CP have to be gained in total. The elective field of „BA/EC/OR/STAT“ has to be covered with 18 CP in total; whereby 9 CP have to be gained within a module of BA.

Figure 1: Structure of the Master Programme in Information Engineering and Management (Recommendation)

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://studium.kit.edu/Seiten/FAQ.aspx>

Repeating exams

Principally, a failed exam can repeated only once. If the **repeat examination** (including an eventually provided verbal repeat examination) will be failed as well, the **examination claim** is lost. Requests for a second repetition of an exam require the approval of the examination committee. A request for a second repetition has to be made without delay after loosing the examination claim. A counseling interview is mandatory. For further information see <http://www.wiwi.kit.edu/serviceHinweise.php>.

Bonus accomplishments and additional accomplishments

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

Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Up to 2 modules with a minimum of 9 CP may appear additionally in the certificate. After the approval of the examination committee, it is also possible to include modules in the certificate, which are not defined in the module handbook. Single additional courses will be recorded in the transcript of records. Courses and modules, which have been declared as bonus accomplishments, can be changed to additional accomplishments.

Further information

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

Used abbreviations

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

3 Actual Changes

Important changes are pointed out in this section in order to provide a better orientation. Although this process was done with great care, other/minor changes may exist. Please also check our updates on http://www.wiwi.kit.edu/lehreMHB.php#mhb_aktuell

IW4BWLKSR1 - Service Analytics (S. 22)

Anmerkungen

Starting summer term 2015, the lecture "Service Analytics II – Enterprise Data Reduction and Prediction" [2540498] can be chosen in the module.

IW4BWLFBV2 - Finance 2 (S. 25)

Anmerkungen

The course *eFinance: Information Engineering and Management for Securities Trading* [2540454] can be chosen from summer term 2015 on.

IW4BWL01 - Strategic Corporate Management and Organization (S. 28)

Anmerkungen

The module will not be offered any more from summer term 2015. Students who are already assigned on the module can still finish it until summer term 2016.

The course "Organization Theory" will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

The credits for the courses "Managing Organizations" and "Management and Strategy" have been changed from 4 to 3,5 from summer term 2015 on.

IW4BWL04 - Strategic Decision Making and Organization (S. 29)

Anmerkungen

The course "Organization Theory" will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

IW4BWLIP4 - Energy Economics and Energy Markets (S. 32)

Anmerkungen

The course "Basics of Liberalised Energy Markets" [2581998] will be reduced to 3 credits in winter term 2015/2016.

IW4BWL05 - Marketing Management (S. 36)

Anmerkungen

The course "Open Innovation – Concepts, Methods and Best Practices" [2571199] has been added summer 2015.

Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.

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

IW4VWL15 - Microeconomic Theory (S. 45)

Anmerkungen

Starting summer term 2015, the lecture "Auction Theory" [2590408] can be chosen in the module.

IW4STAT1 - Mathematical and Empirical Finance (S. 52)

Anmerkungen

The course Portfolio and Asset Liability Management [2520357] will not be offered any more from summer term 2015 on. The examination will probably be offered latest until summer term 2014. Instead of this lecture Statistical Methods in Financial Risk Management [2521353] will be offered in winter term 2014/2015.

IW4INAIFB11 - Development of Business Information Systems (S. 89)

Bedingungen

The course *Datenbanksysteme und XML* [2511202] or the course *Software Quality Management* [2511208] must be examined.

4 Mandatory Modules

4.1 All Subjects

Module: Information Engineering and Management [IW4WWIW]

Coordination: C. Weinhardt, A. Geyer-Schulz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration (obligatory)

ECTS Credits	Cycle	Duration
10	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540450	Principles of Information Engineering and Management	2/1	W	5	C. Weinhardt, T. Teubner
2540500	Business Administration in Information Engineering and Management	2/1	S	5	A. Geyer-Schulz

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

The student

- understands and analyzes the central role of information as an economic good, a production factor, and a competitive factor,
- identifies, evaluates, prices, and markets information goods,
- evaluates information flows and the value of information in an interdisciplinary context,
- works out solutions in teams,
- transfers models from Business Administration to situations in business whose basic conditions are changed due to the implementation of information and communication technology,
- applies methods from Business Administration (Decision theory, game theory, operations research, etc.) to questions of Information Engineering and Management,
- analyzes the potential to automatize the decision making process in businesses by data bases,
- describes the process to extract relevant data for decision making from operational accounting systems.

Content

The module *Information Engineering and Management* comprises the lectures *Principles of Information Engineering and Management* [2540450] and *Business Administration in Information Engineering and Management* [2540500].

In the lecture *Principles of Information Engineering and Management*, a clear distinction of information as a production, competitive, and economic good is introduced. The central role of information is explained through the concept of the "information lifecycle". The single phases from extraction/generation through storage transformation and evaluation until the marketing and usage of information are analyzed from the business administration perspective and the microeconomic perspective. The state of the art of economic theory is presented throughout the different phases of the information lifecycle. The lecture is complemented by accompanying exercise courses.

In the lecture *Business Administration in Information Engineering and Management*, classical Business Administration is applied to businesses in an information- and communication technological environment. The process to extract relevant data for decision making from operational accounting systems receives special attention. In order to do so, topics such as activity-based costing and transaction costs models are addressed. The automatization of the decision making process in businesses by data bases is

another focus of the module. To solve such issues within a company, relevant methods such as decision theory and game theory are lectured. Finally, complex business relevant questions in a dynamically changing environment are addressed by presenting models and methods from system dynamics.

Module: Stochastic Models in Information Engineering and Management [IW4WWOR]

Coordination: K. Waldmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Operations Research (obligatory)

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2550679	Markov Decision Models I	2/1/2	W	5	K. Waldmann

Learning Control / Examinations

The assessment of the module is in a written examination according to §4(2), 1 of the examination regulation. In each term (usually in March and July), one examination is held for both courses. The grade of the module corresponds to the grade of this examination.

Conditions

None.

Qualification Goals

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 are no longer a nice theory but an important tool in order to model, analyse, and optimize a stochastic system as it evolves over time.

Topics overview: Markov chains, Poisson Processes.

Remarks

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

Module: Interdisciplinary Seminar Module [IW4IWSEM]

Coordination: Studiendekan (Fak. f. Wirtschaftswissenschaften), Studiendekan/in (Fak. f. Informatik)
Degree programme: Informationswirtschaft (M.Sc.)
Subject:

ECTS Credits	Cycle	Duration
6	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540510	Master Seminar in Information Engineering and Management	2	W	3	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	3	C. Weinhardt
SemIIP2	Seminar in Industrial Production	2	W/S	3	F. Schultmann, M. Fröhling
SemEW	Seminar Energy Economics	2	W/S	3	W. Fichtner, P. Jochem, D. Kelles, R. McKenna, V. Bertsch
2572197	Seminar in strategic and behavioral marketing	2	W	3	B. Neibecker
2577915	Seminar: Management and Organization	2	W/S	3	H. Lindstädt
2579904	Seminar Management Accounting	2	W/S	3	M. Wouters
2579905	Special Topics in Management Accounting	2		3	M. Wouters, F. Stadtherr
SemTuE1	Entrepreneurship Seminar			3	O. Terzidis
SemTuE2	Seminar Innovation management			3	M. Weissenberger-Eibl
2530280	Seminar in Finance	2	W/S	3	M. Uhrig-Homburg, M. Ruckes
2595477	Practical Seminar Service Innovation	3		4,5	G. Satzger
2595470	Seminar Service Science, Management & Engineering	2	W/S	4	C. Weinhardt, R. Studer, S. Nickel, H. Fromm, W. Fichtner, G. Satzger
2595475	Seminar Mobility Services	2	W	3	G. Satzger, C. Stryja
SemFBV1	Seminar Risk and Insurance Management	2	W/S	3	U. Werner
2530353	Seminar Financial Economics and Risk Management	2	W/S	3	M. Ulrich
SemWIOR1	Seminar Stochastic Models	2	W/S	3	K. Waldmann
SemWIOR2	Seminar Economic Theory	2	W/S	3	C. Puppe
SemWIOR3	Seminar in Experimental Economics	2	W/S	3	N. N.
n.n.	Seminar in Behavioral and Experimental Economics	2	W/S	3	P. Reiss
2560141	Seminar on Morals and Social Behavior	2	W/S	3	N. Szech
2560140	Seminar on Topics in Political Economics	2	W/S	3	N. Szech
2550131	Seminar in Continuous Optimization	2	W/S	3	O. Stein
2550491	Seminar in Discrete Optimization	2	W/S	3	S. Nickel
SemSTAT	Seminar Statistics	2		3	N.N.
SemAIFB1	Seminar in Enterprise Information Systems	2	W/S	3	R. Studer, A. Oberweis, T. Wolf, R. Kneuper
SemAIFB2	Seminar Efficient Algorithms	2	W/S	3	H. Schmeck
SemAIFB4	Seminar Knowledge Management	2	W	3	R. Studer
rechtsem	Seminar in Law	2	W/S	3	T. Dreier
RIO		2	S	3	G. Sydow

Learning Control / Examinations

The assessment in this module is regulated by § 4 (2) 3, of the examination regulation for the Master Information Engineering and Management. Further details will be defined for each seminar separately.

Conditions

Students should have experience with literature search in informatics, economics, business administration, and law. They should know the methods of scientific work, presentation techniques for scientific presentations, as well as the form requirements of scientific publications (guide line for authors) and review processes for scientific publications.

For further details see German version.

Qualification Goals

- In the interdisciplinary seminar Information Engineering and Management students investigate a recent topic in Information Engineering and Management with the scientific methods of the disciplines of the degree programme.
- They develop interdisciplinary solution approaches on the base of the state-of-the art in the disciplines.
- They present selected solution approaches and methods on an expert level and they defend and rationalize the selected solution approaches and methods in a discussion with scientific arguments.
- They write a seminar paper whose form is appropriate for a scientific journal.
- They revise their paper taking into account the reviews of their tutors in an appropriate manner.

Content

The Students will be coached by a group of tutors which consists in each case of an tutor of informatics, economics and law.

Module: Master Thesis [IW4IWMATHESIS]

Coordination: Studiendekan (Fak. f. Wirtschaftswissenschaften), Vorsitzender des Prüfungsausschusses
Degree programme: Informationswirtschaft (M.Sc.)
Subject:

ECTS Credits	Cycle	Duration
30		

Learning Control / Examinations

Examination by two examiners from the two faculties. For details refer to examination regulation. The examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.

Conditions

Regulated in §11 of the examination regulation.

The requirements for the examiner are described in §14 (2) of the examination regulation.

Qualification Goals

The student

- investigates a topic in Information Engineering and Management autonomously in a scientific manner at the state-of-the-art of the research in the field.
- shows a comprehensive understanding of the methods and approaches relevant for the investigation of the topic chosen.
- selects appropriate scientific methods and he uses them in a correct way. If necessary, he modifies methods in a suitable way or he develops them.
- compares his results with competing approaches critically and he evaluates his results.
- communicates his results clearly and in a scientific form in his master thesis.

Content

- The master thesis shows that the candidate can autonomously investigate a problem from his discipline with scientific methods according to the state-of-the-art of the discipline within a specified time period.
- The master thesis can be written in German or English.
- The topic of a master thesis can be accepted or chosen by each of the examiners according to examination regulation. The examiner accepting a topic for a master thesis acts as the first supervisor of this thesis.
- Writing a master thesis with a supervisor who is not a member of the two faculties participating in the degree programme (Department of Informatics, Department of Economics and Management) requires acceptance by the examination board of the degree programme. The candidate must have an opportunity to make suggestions for the topic of the master thesis.
- Candidates can write a master thesis in teams. However, this requires that the contribution and performance of each candidate to the thesis is identifiable according to objective criteria which allow a unique delineation of each candidate's contribution. The contribution of each candidate regarded in isolation must fulfill the requirements a individual master thesis.
- In exceptional cases and upon request of the candidate, the chairman of the examination board chooses a supervisor and requests that this supervisor provides the candidate with a topic for the master thesis within 4 weeks after the request. In this case, the candidate is informed by the chairman of the examination board about the topic selected.
- Topic, specification of research tasks and the volume of the master thesis should be limited by the supervisor, so that the master thesis can be written with the assigned workload of 30 credits (750-900h).
- The master thesis must contain the following declaration of the candidate: "I truthfully assure that I have autonomously written this master thesis. I have quoted all sources used precisely and completely. I have labelled everything which has been taken from the work of others with or without change." A master thesis without this declaration will not be accepted.
- The date of the assignment of the topic to a candidate as well as the date of delivery of the master thesis should be registered at the examination board. The candidate can return a topic for the master thesis only one time and only within a period of two month after he has received the topic. Upon a request of the candidate with reasons supporting an extension, the examination board may extend the deadline for the delivery of the master thesis by a maximum of three months. A master thesis not delivered within time is graded as "fail" except when the candidate is not responsible for this delay (e.g. protection of motherhood).
- The master thesis is reviewed and graded by the supervisor and the additional examiner. The team of supervisor and examiner must represent both faculties participating in the degree programme (Department of Informatics, Department of Economics and Management). At least one of the two must be professor or junior professor. If the grades of the supervisor and the examiner differ, the examination board sets the mark within this limit.
- Reviewing and grading should be done within 8 weeks after delivery of the master thesis.

5 Elective Modules

5.1 Business Administration

Module: Advanced CRM [IW4BWLISM1]

Coordination: A. Geyer-Schulz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540508	Customer Relationship Management	2/1	W	4,5	A. Geyer-Schulz
2540506	Recommender Systems	2/1	S	4,5	A. Geyer-Schulz, A. Sonnenbichler
2540533	Personalization and Services	2/1	S	4,5	A. Sonnenbichler
2540518	Social Network Analysis in CRM	2/1	S	4,5	A. Geyer-Schulz
2540531	Business Dynamics	2/1	W	4,5	A. Geyer-Schulz, P. Glenn
2595501	Service Analytics	2/1	S	4,5	T. Setzer, H. Fromm

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

Conditions

None.

Qualification Goals

The student

- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services,
- models, analyzes and optimizes the structure and dynamics of complex business applications,
- develops and realizes personalized services, especially in the field of recommendation services,
- analyzes social networks and knows their application field in CRM,
- works in teams.

Content

Besides the foundations of modern customer oriented and service oriented management, developments of CRM systems are lectured together with tools for analysis and optimization of such systems.

An overview of general aspects and concepts of personalization and their importance for service provider and customers is given. Then, different categories of recommendation systems are presented: Ranging from explicit recommendation services like reviews to implicit services like the calculation of recommendations based on the historic data about products and/or customers.

There exist a trend towards viewing economic systems and social systems as networks. This approach allows for the application of different methods from mathematics, economic sciences, sociology and physics. In CRM, net work analyses may provide benefits calculating customer network values.

CRM processes and marketing campaigns are just two examples of dynamic systems that are characterized by feedback loops between different process steps. By means of the tools of business dynamics such processes can be modelled. Simulations of complex systems allow the analysis and optimization of business processes, marketing campaigns, and organizations.

Remarks

The course Social Network Analysis in CRM [2540518] is currently not offered.

The courses *Recommendersystems* and *Personalization and Services* will take place in an alternating way from summer term 14. Details on the cycle and on the exams can be found on <http://www.em.uni-karlsruhe.de/studies/>.

Module: Electronic Markets [IW4BWLISM2]

Coordination: A. Geyer-Schulz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540502	Markets and Organizations: Principles	2/1	W	4,5	A. Geyer-Schulz
2540460	Market Engineering: Information in Institutions	2/1	S	4,5	C. Weinhardt
2561232	Telecommunication and Internet Economics	2/1	W	4,5	K. Mitusch
2540531	Business Dynamics	2/1	W	4,5	A. Geyer-Schulz, P. Glenn
2540500	Business Administration in Information Engineering and Management	2/1	S	5	A. Geyer-Schulz

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

The student

- knows coordination and motivation methods and analyzes them regarding their efficiency,
- classifies markets and describes the roles of the participants in a formal way,
- knows the conditions for market failure and knows and develops countermeasures,
- knows institutions and market mechanisms, their fundamental theories and empirical research results,
- knows the design criteria of market mechanisms and a systematical approach for creating new markets,
- models, analyzes and optimizes the structure and dynamics of complex business applications.

Content

What are the conditions that make electronic markets develop and how can one analyse and optimize such markets?

In this module, the selection of the type of organization as an optimization of transaction costs is treated. Afterwards, the efficiency of electronic markets (price, information and allocation efficiency) as well as reasons for market failure are described. Finally, motivational issues like bounded rationality and information asymmetries (private information and moral hazard), as well as the development of incentive schemes, are presented. Regarding the market design, especially the interdependencies of market organization, market mechanisms, institutions and products are described and theoretical foundations are lectured.

Electronic markets are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such markets can be modelled. Simulations of complex systems allow the analysis and optimization of markets, business processes, policies, and organizations.

Topics include:

- classification, analysis, and design of markets
- simulation of markets
- auction methods and auction theory
- automated negotiations
- nonlinear pricing
- continuous double auctions
- market-maker, regulation, control

Module: Market Engineering [IW4BWLISM3]

Coordination: C. Weinhardt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540460	Market Engineering: Information in Institutions	2/1	S	4,5	C. Weinhardt
2590408	Auction Theory	2/1	W	5	K. Ehrhart
2540454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4,5	C. Weinhardt
2590458	Computational Economics	2/1	W	4,5	P. Shukla, S. Caton
2540489	Experimental Economics	2/1	W	4,5	C. Weinhardt, T. Teubner
2540464	eEnergy: Markets, Services, Systems	2/1	S	4,5	C. Weinhardt

Learning Control / Examinations

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

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

Conditions

The course *Market Engineering: Information in Institutions* [2540460] is compulsory and must be examined.

Qualification Goals

The students

- know the design criterias of market mechanisms and the systematic approach to create new markets,
- understand the basics of the mechanism design and auction theory,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

Content

This module explains the dependencies between the design von markets and their success. Markets are complex interaction of different institution and participants in a market behave strategically according to the market rules. The development and the design of markets or market mechanisms has a strong influence on the behavior of the participants. A systematic approach and a thorough analysis of existing markets is inevitable to design, create and operate a market place successfully. the approaches for a systematic analysis are explained in the mandatory course *Market Engineering* [2540460] by discussing theories about mechanism design and institutional economics. The student can deepen his knowledge about markets in a second course.

Module: Business & Service Engineering [IW4BWLISM4]

Coordination: C. Weinhardt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits 9	Cycle Every term	Duration 1
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Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540456	Business Models in the Internet: Planning and Implementation	2/1	S	4,5	T. Teubner, R. Knapper
2540498	Special Topics in Information Engineering & Management	3	W/S	4,5	C. Weinhardt
2540506	Recommender Systems	2/1	S	4,5	A. Geyer-Schulz, A. Sonnenbichler
2540533	Personalization and Services	2/1	S	4,5	A. Sonnenbichler
2595468	Service Innovation	2/1	S	4,5	G. Satzger, M. Kohler, N. Feldmann
2595477	Practical Seminar Service Innovation	3		4,5	G. Satzger

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

The student should

- learn to develop and implement new markets with regards to the technological progresses of information and communication technology and the increasing economic networking
- learn to restructure and develop new business processes in markets under those conditions
- understand service competition as a sustainable competitive strategy and understand the effects of service competition on the design of markets, products, processes and services.
- improve his statistics skills and apply them to appropriate cases
- learn to elaborate solutions in a team

Content

This module addresses the challenges of creating new kinds of products, processes, services, and markets from a service perspective in the context of new developed information and communication technologies and the globalization process. The module describes service competition as a business strategy in the long term that leads to the design of business processes, business models, forms of organization, markets, and competition. This will be shown by actual examples from personalized services, recommender services and social networks.

Remarks

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

The courses *Recommendersystems* and *Personalization and Services* will take place in an alternating way from summer term 14. Details on the cycle and on the exams can be found on <http://www.em.uni-karlsruhe.de/studies/>.

Module: Communications & Markets [IW4BWLISM5]

Coordination: C. Weinhardt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540462	Communications Economics	2/1	S	4,5	J. Kraemer
2540460	Market Engineering: Information in Institutions	2/1	S	4,5	C. Weinhardt
2590408	Auction Theory	2/1	W	5	K. Ehrhart
2540498	Special Topics in Information Engineering & Management	3	W/S	4,5	C. Weinhardt
2540470	Modeling and Analyzing Consumer Behaviour with R	2/1	S	4,5	V. Dorner, C. Weinhardt

Learning Control / Examinations

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

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

Conditions

The course *Communications Economics* [2540462] is compulsory and must be examined.

Qualification Goals

The student is able to

- understand the game theoretic basics of Industrial Economics
- understand the relationship between incentive mechanisms and the network economy
- analyse and evaluate markets and auction mechanisms using methods from game theory
- elaborate solutions in a team

Content

The module has a focus on applied game-theoretic analysis of information exchange and incentive mechanisms. Single participants in a market make decisions concerning their products, the price determination and competitive position, which can change the situation in a market. These changes inflict a change in corporate policy. Approaches from game-theory in industrial economics and mechanism design are offering analytic tools by which one can systematically deduce strategic decisions for businesses, given a certain market situation.

Remarks

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

Module: Service Management [IW4BWLISM6]

Coordination: C. Weinhardt, G. Satzger
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2595484	Business and IT Service Management	2/1	W	4,5	G. Satzger
2595468	Service Innovation	2/1	S	4,5	G. Satzger, M. Kohler, N. Feldmann
2595501	Service Analytics	2/1	S	4,5	T. Setzer, H. Fromm
2595505	Industrial Services	2/1	W	4,5	H. Fromm
2540470	Modeling and Analyzing Consumer Behaviour with R	2/1	S	4,5	V. Dorner, C. Weinhardt

Learning Control / Examinations

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

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

Conditions

The course *Business and IT Service Management* [2590484] is compulsory and must be examined

Qualification Goals

The students

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- systematically use vast amounts of available data for planning, operation, personalization and improvement of complex service offerings, and
- understand and analyze innovation processes in corporations.

Content

The module service management addresses the basics of developing and managing IT-based services. The lectures contained in this module teach the basics of developing and managing IT-based services and the application of OR methods in the field of service management. Moreover, students learn to systematically analyze vast amounts of data for planning, operation and improvement for complex service offerings. These tools enhance operational and strategic decision support and help to analyze and understand the overall innovation processes in corporations. Current examples from research and industry demonstrate the relevance of the topics discussed in this module.

Module: Service Analytics [IW4BWLKSR1]

Coordination: H. Fromm, C. Weinhardt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2595501	Service Analytics	2/1	S	4,5	T. Setzer, H. Fromm
2595505	Industrial Services	2/1	W	4,5	H. Fromm
2540498	Special Topics in Information Engineering & Management	3	W/S	4,5	C. Weinhardt
2540470	Modeling and Analyzing Consumer Behaviour with R	2/1	S	4,5	V. Dorner, C. Weinhardt
2540498	Service Analytics II – Enterprise Data Reduction and Prediction	2/1	S	4,5	T. Setzer, C. Weinhardt

Learning Control / Examinations

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

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

Conditions

The course Service Analytics [2595501] is compulsory and must be examined.

Recommendations

Basic knowledge of Operations Research, Descriptive Statistics, and Inferential Statistics is assumed.

Qualification Goals

The student should learn to

- Understand different scenarios where analytics is applied in a service context
- Distinguish different analytics methods and concepts and learn when to apply them
- Apply analytics tools in a service context
- Analyze and solve real-world business problems through leveraging analytics

Content

Modern economies have turned into “servitized” economies – with almost 70% of the gross value added being derived from the tertiary sector and with an increasing number of industrial companies proceeding to engage in service-type offerings. The adoption of analytics applied to services for leveraging the full potential of big data is still in its infancy - some areas like web analytics are more advanced, some other areas are just starting. This module strives to provide an overview on analytics methods applied in a service context and introduces different scenarios where analytics is applied to improve different kinds of services. The module offers the opportunity to apply and deepen this knowledge in hands-on tutorials and seminars.

Remarks

Starting summer term 2015, the lecture “Service Analytics II – Enterprise Data Reduction and Prediction” [2540498] can be chosen in the module.

Module: Service Design Thinking [IW4BWLKSR2]

Coordination: C. Weinhardt, G. Satzger
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2595600	Service Design Thinking	6	W/S	9	C. Weinhardt

Learning Control / Examinations

The assessment is carried out as a general exam (according to Section 4(2), 3 of the examination regulation). The overall grade of the module is the grade of the examination (according to Section 4(2), 3 of the examination regulation).

Conditions

The course Service Design Thinking is compulsory and must be examined.

Recommendations

This course is held in English – proficiency in writing and communication is required.

Qualification Goals

- Deep knowledge of the innovation method “Design Thinking”, as introduced and promoted by Stanford University
- Development of new, creative solutions through extensive observation of oneself and one’s environment, in particular with regard to the relevant service users
- Know how to use prototyping and experimentation to visualize one’s ideas, to test and iteratively develop them, and to converge on a solution
- Communicate, work and present in an interdisciplinary and international project setting

Content

- Paper Bike: Learning about the basic method elements by building a paper bike that has to fulfill a given set of challenges.
- Design Space Exploration: Exploring the problem space through customer and user observation.
- Critical Function Prototype: Identification of critical features from the customer’s perspective that can contribute to the solution of the overarching problem. Building and testing prototypes that integrate these functionalities.
- Dark Horse Prototype: Inverting earlier assumptions and experiences, which leads to the inclusion of new features and solutions.
- Funky Prototype: Integration of the individually tested and successful functions to a complete solution, which is further tested and developed.
- Functional Prototype: Further selection and convergence of existing ideas. Building a higher resolution prototype that can be tested by customers.
- Final Prototype: Preparing and presenting the final solution to the customer.

Remarks

Due to the project nature of the course, the number of participants is limited. For further information see the course description.

Module: Finance 1 [IW4BWLFBV1]

Coordination: M. Uhrig-Homburg, M. Ruckes
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2530550	Derivatives	2/1	S	4,5	M. Uhrig-Homburg
2530212	Valuation	2/1	W	4,5	M. Ruckes
2530555	Asset Pricing	2/1	S	4,5	M. Uhrig-Homburg, M. Ruckes

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

Conditions

None.

Qualification Goals

The student

- has core skills in economics and methodology in the field of finance
- assesses corporate investment projects from a financial perspective
- is able to make appropriate investment decisions on financial markets

Content

The courses of this module equip the students with core skills in economics and methodology in the field of modern finance. Securities which are traded on financial and derivative markets are presented, and frequently applied trading strategies are discussed. A further focus of this module is on the assessment of both profits and risks in security portfolios and corporate investment projects from a financial perspective.

Module: Finance 2 [IW4BWLFBV2]

Coordination: M. Uhrig-Homburg, M. Ruckes
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2530260	Fixed Income Securities	2/1	W	4,5	M. Uhrig-Homburg
2530214	Corporate Financial Policy	2/1	S	4,5	M. Ruckes
2530240	Market Microstructure	2/0	W	3	T. Lüdecke
2530565	Credit Risk	2/1	W	4,5	M. Uhrig-Homburg
2530210	Cost and Management Accounting	2/1	S	4,5	T. Lüdecke
2530555	Asset Pricing	2/1	S	4,5	M. Uhrig-Homburg, M. Ruckes
2530212	Valuation	2/1	W	4,5	M. Ruckes
2530550	Derivatives	2/1	S	4,5	M. Uhrig-Homburg
2530570	International Finance	2	S	3	M. Uhrig-Homburg, Dr. Walter
2530299	Business Strategies of Banks	2	W	3	W. Müller
2530296	Exchanges	1	S	1,5	J. Franke
2530232	Financial Intermediation	3	W	4,5	M. Ruckes
2540454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4,5	C. Weinhardt

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

Conditions

It is only possible to choose this module in combination with the module *F1 (Finance)* [IW4BWLFBV1]. The module is passed only after the final partial exam of *F1 (Finance)* is additionally passed.

Qualification Goals

The student is in a position to discuss, analyze and provide answers to advanced economic and methodological issues in the field of modern finance.

Content

The module Finance 2 is based on the module Finance 1. The courses of this module equip the students with advanced skills in economics and methodology in the field of modern finance on a broad basis.

Remarks

The course eFinance: Information Engineering and Management for Securities Trading [2540454] can be chosen from summer term 2015 on.

Module: Insurance Management I [IW4BWLFBV6]

Coordination: U. Werner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2550055	Principles of Insurance Management	3/0	S	4,5	U. Werner
2530323	Insurance Marketing	3/0	S	4,5	E. Schwake
2530324	Insurance Production	3/0	W/S	4,5	U. Werner
2530050	Private and Social Insurance	2/0	W	2,5	W. Heilmann, K. Besserer
2530350	Current Issues in the Insurance Industry	2/0	S	2	W. Heilmann
2530335	Insurance Risk Management	2/0	S	2,5	H. Maser
INSGAME	P&C Insurance Simulation Game	3	W	3	U. Werner
2530395	Risk Communication	3/0	W/S	4,5	U. Werner
2530355	Modelling, Measuring and Managing of Extreme Risks	2	S	2,5	U. Werner, S. Hochrainer

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

See German version.

Content

See German version.

Module: Insurance Management II [IW4BWLFBV7]

Coordination: U. Werner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2530323	Insurance Marketing	3/0	S	4,5	E. Schwake
2530324	Insurance Production	3/0	W/S	4,5	U. Werner
2530050	Private and Social Insurance	2/0	W	2,5	W. Heilmann, K. Besserer
2530350	Current Issues in the Insurance Industry	2/0	S	2	W. Heilmann
2530335	Insurance Risk Management	2/0	S	2,5	H. Maser
2530395	Risk Communication	3/0	W/S	4,5	U. Werner
INSGAME	P&C Insurance Simulation Game	3	W	3	U. Werner
2550055	Principles of Insurance Management	3/0	S	4,5	U. Werner
2530355	Modelling, Measuring and Managing of Extreme Risks	2	S	2,5	U. Werner, S. Hochrainer

Learning Control / Examinations

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

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

Conditions

It is only possible to choose this module in combination with the module *Insurance Management I*. The module is passed only after the final partial exam of *Insurance Management I* has been passed.

Recommendations

The courses chosen from the modules Insurance Management I or Insurance Management II are supposed to complement each other. Advice and information is available from the person responsible for the examination process at the Insurance Department of FBV.

Qualification Goals

See German version.

Content

See German version.

Remarks

See German version.

Module: Strategic Corporate Management and Organization [IW4BWL01]

Coordination: H. Lindstädt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2577904	Organization Theory	2	W	4,5	H. Lindstädt
2577902	Managing Organizations	2/0	W	3,5	H. Lindstädt
2577908	Modeling Strategic Decision Making	2	S	4,5	H. Lindstädt
2577900	Management and Strategy	2/0	S	3,5	H. Lindstädt
2577910	Problem solving, communication and leadership	1/0	S	2	H. Lindstädt

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

See German version.

Content

The module emphasizes the following aspects: The students learn models and frameworks which are used in strategic management and managing organizations. In addition, the module provides knowledge about management concepts and their practical application.

The module addresses three focal points: First, the students will learn models, frameworks and theoretical findings of the economic organization theory. Further, questions of a value-based concern leadership are discussed. Finally, the limitations of the basic models of economic decision theory are identified and advanced concepts are developed.

Remarks

The module will not be offered any more from summer term 2015. Students who are already assigned on the module can still finish it until summer term 2016.

The course "Organization Theory" will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

The credits for the courses "Managing Organizations" and "Management and Strategy" have been changed from 4 to 3,5 from summer term 2015 on.

Module: Strategic Decision Making and Organization [IW4BWL04]

Coordination: H. Lindstädt
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2577904	Organization Theory	2	W	4,5	H. Lindstädt
2577908	Modeling Strategic Decision Making	2	S	4,5	H. Lindstädt
2561127	Public Management	2	W	4,5	B. Wigger, Assistenten
2572157	Pricing	2/1	W	4,5	M. Klarmann

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.

Conditions

None.

Qualification Goals

See German version.

Content**Remarks**

The course "Organization Theory" will not be offered any more from summer term 2015 on. The examination will be offered latest until winter term 2015/2016 (repeaters only).

Module: Industrial Production II [IW4BWLIIIP2]

Coordination: F. Schultmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2581952	Planning and Management of Industrial Plants	2/2	W	5,5	F. Schultmann
2581962	Emissions into the Environment	2/0	W	3,5	U. Karl
2581995	Material Flow Analysis and Life Cycle Assessment	2/0	W	3,5	L. Schebek
2581956	International Management in Engineering and Production	2/0	W	3,5	H. Sasse

Learning Control / Examinations

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Planning and Managing of Industrial Plants* [2581952] and one further single course of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course *Planning and Managing of Industrial Plants* [2581952] and at least one additional activity are compulsory and must be examined.

Qualification Goals

- Students shall be able to describe the tasks of tactical production management with special attention drawn upon industrial plants.
- Students shall understand the relevant tasks in plant management (projection, realisation and supervising tools for industrial plants).
- Students shall be able to describe the special need of a techno-economic approach to solve problems in the field of tactical production management.
- Students shall be proficient in using selected techno-economic methods like investment and cost estimates, plant layout, capacity planning, evaluation principles of production techniques, production systems as well as methods to design and optimize production systems.
- Students shall be able to evaluate techno-economical approaches in planning tactical production management with respect to their efficiency, accuracy and relevance for industrial use.

Content

- Planning and Management of Industrial Plants: Basics, circulation flow starting from projecting to techno-economic evaluation, construction and operating up to plant dismantling.

Remarks

Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production III.

Module: Industrial Production III [IW4BWLIIIP6]

Coordination: F. Schultmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2581954	Production and Logistics Management	2/2	S	5,5	M. Fröhling
2581963	The Management of R&D Projects with Case Studies	2	W/S	3,5	H. Schmied
2581961	Supply Chain Management with Ad- vanced Planning Systems	2	S	3,5	M. Göbelt, C. Sürle
2581992	Risk Management in Industrial Supply Networks	2/0	W	3,5	M. Wiens
2581957	Supply Chain Management in the auto- motive industry	2/0	W	3,5	T. Heupel, H. Lang

Learning Control / Examinations

The assessment is carried out as partial exams (according to section 4 (2), 1 SPO) of the core course *Production and Logistics Management* [2581954] and further single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

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

Conditions

The course *Production and Logistics Management* [2581954] and at least one additional activity are compulsory and must be examined.

Qualification Goals

- Students describe the tasks concerning general problems of an operative production and logistics management.
- Students describe the planning tasks of supply chain management.
- Students use proficiently approaches to solve general planning problems.
- Students explain the existing interdependencies between planning tasks and applied methods.
- Students describe the main goals and set-up of software supporting tools in production and logistics management (i.e. APS, PPS-, ERP- and SCM Systems).
- Students discuss the scope of these software tools and their general disadvantages.

Content

- Planning tasks and exemplary methods of production planning and control in supply chain management.
- Supporting software tools in production and logistics management (APS, PPS- and ERP Systems).
- Project management in the field of production and supply chain management.

Remarks

Apart from the core course the courses offered are recommendations and can be replaced by courses from the Module Industrial Production II.

Module: Energy Economics and Energy Markets [IW4BWLIIIP4]

Coordination: W. Fichtner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2581998	Basics of Liberalised Energy Markets	2/1	W	3,5	W. Fichtner
2581020	Energy Trade and Risk Management	3	S	4	W. Fichtner, D. Keles, C. Cremer
2581959	Energy Policy	2/0	S	3,5	M. Wietschel
2581022	Gas-Markets	2/0	W	3	A. Pustisek
2581025	Simulation Game in Energy Economics	2/0	S	3	W. Fichtner
2560234	Regulation Theory and Practice	2/1	S	4,5	K. Mitusch
2540464	eEnergy: Markets, Services, Systems	2/1	S	4,5	C. Weinhardt
2581007	Quantitative Methods in Energy Economics	2/1	W	4	D. Keles, P. Plötz

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 take place 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. Additional courses might be accredited upon request.

Conditions

The lecture *Basics of Liberalised Energy Markets* [2581998] has to be examined.

Recommendations

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

Qualification Goals

The student

- gains detailed knowledge about the new requirements of liberalised energy markets,
- describes the planning tasks on the different energy markets,
- knows solution approaches to respective planning tasks.

Content

Basics of Liberalised Energy Markets: The European liberalisation process, energy markets, pricing, market failure, investment incentives, market power

Energy Trade and Risk Management: trade centres, trade products, market mechanisms, position and risk management

Gas-Markets: producing countries, provision structures, market places, pricing

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

Simulation Game in Energy Economics: Simulation of the German electricity system

Remarks

The course "Basics of Liberalised Energy Markets" [2581998] will be reduced to 3 credits in winter term 2015/2016.

Module: Energy Economics and Technology [IW4BWLIIIP5]

Coordination: W. Fichtner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2581003	Energy and Environment	2/1	S	4,5	U. Karl, n.n.
2581958	Strategical Aspects of Energy Economy	2/0	W	3,5	A. Ardone
2581000	Technological Change in Energy Economics	2/0	W	3	M. Wietschel
2581001	Heat Economy	2/0	S	3	W. Fichtner
2581002	Energy Systems Analysis	2/0	W	3	V. Bertsch
2581006	Efficient Energy Systems and Electric Mobility	2/0	S	3,5	R. McKenna, P. Jochem

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 take place 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. Additional courses might be accredited upon request.

Conditions

None.

Recommendations

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

Qualification Goals

The student

- gains detailed knowledge about present and future energy supply technologies (focus on final energy carriers electricity and heat),
- knows the techno-economic characteristics of plants for energy provision, for energy transport as well as for energy distribution and demand,
- is able to assess the environmental impact of these technologies.

Content

Strategical Aspects of Energy Economy: Long-term planning methods, generation technologies

Technological Change in Energy Economics: Future energy technologies, learning curves, energy demand

Heat Economy: district heating, heating technologies, reduction of heat demand, statutory provisions

Energy Systems Analysis: Interdependencies in energy economics, energy systems modelling approaches in energy economics

Energy and Environment: emission factors, emission reduction measures, environmental impact

Efficient Energy Systems and Electric Mobility: concepts and current trends in energy efficiency, Overview of and economical, ecological and social impacts through electric mobility

Module: Entrepreneurship (EnTechnon) [IW4BWLENT1]

Coordination: O. Terzidis, A. Presse
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2545001	Entrepreneurship	2	W/S	3	O. Terzidis
2545010	Design Thinking	2	W/S	3	O. Terzidis, Dr. Kneisel, Dr. H. Haller, P. Nitschke
2545005	Business Planning	2	W/S	3	O. Terzidis, Mitarbeiter des Lehrstuhls
2545012	Entrepreneurial Leadership & Innovation Management	2	W	3	O. Terzidis, C. Linz
2545003	Managing New Technologies	2/1	S	5	T. Reiß
2572184	Business Plan Workshop	1	S	3	M. Klarmann, O. Terzidis
2545015	Innovation Management: Concepts, Strategies and Methods	2	S	3	M. Weissenberger-Eibl
2540456	Business Models in the Internet: Planning and Implementation	2/1	S	4,5	T. Teubner, R. Knapper
2513305	Developing Business Models for the Semantic Web	2	W	3	R. Studer, M. Maleshkova, F. Keppmann
2545019	Case studies seminar: Innovation management	2	W	3	M. Weissenberger-Eibl
2545016	Roadmapping	2	S	3	D. Koch
n.n.	Entrepreneurship Research	2	S	3	O. Terzidis, Mitarbeiter

Learning Control / Examinations

See German version.

Conditions

None.

Qualification Goals

See German version.

Content

Module: Innovation Management [IW4BWLENT2]

Coordination: M. Weissenberger-Eibl
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits 9	Cycle Every term	Duration 1
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Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2545015	Innovation Management: Concepts, Strategies and Methods	2	S	3	M. Weissenberger-Eibl
2545016	Roadmapping	2	S	3	D. Koch
2545017	Technology Assessment	2	S	3	D. Koch
2545018	Technologies for Innovation Management	2	W	3	D. Koch
2545019	Case studies seminar: Innovation management	2	W	3	M. Weissenberger-Eibl
2545018	Current issues in Innovation Management	2	W/S	3	M. Weissenberger-Eibl
2545001	Entrepreneurship	2	W/S	3	O. Terzidis
2545010	Design Thinking	2	W/S	3	O. Terzidis, Dr. Kneisel, Dr. H. Haller, P. Nitschke
2545012	Entrepreneurial Leadership & Innovation Management	2	W	3	O. Terzidis, C. Linz

Learning Control / Examinations

See German version.

Conditions

The lecture "Innovation Management: Concepts, Strategies and Methods" and one of the seminars of the chair for Innovation and Technology Management are compulsory. The second seminar can be chosen from the courses of the module.

Recommendations

None.

Qualification Goals

Students develop a comprehensive understanding of the innovation process and its conditionality. There is an additional focus on the concepts and processes which are of particular relevance with regard to shaping the entire process. Various strategies and methods are then taught based on this.

After completing the module, students should have developed a systemic understanding of the innovation process and be able to shape this by developing and applying suitable methods.

Content

The Innovation Management: Concepts, Strategies and Methods lecture course teaches concepts, strategies and methods which help students to form a systemic understanding of the innovation process and how to shape it. Building on this holistic understanding, the seminar courses then go into the subjects in greater depth and address specific processes and methods which are central to innovation management.

Module: Marketing Management [IW4BWL MAR5]

Coordination: M. Klarmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2571154	Product and Innovation Marketing	2/0	S	3	M. Klarmann
2571150	Market Research	2/1	S	4,5	M. Klarmann
2572167	Behavioral Approaches in Marketing	2/1	W	4,5	B. Neibecker
2571165	Strategic and Innovative Decision Making in Marketing	2/1	S	4,5	B. Neibecker
2572184	Business Plan Workshop	1	S	3	M. Klarmann, O. Terzidis
2571176	Marketing Strategy Business Game	1	S	1,5	M. Klarmann, Mitarbeiter
2571185	Strategic Brand Management	1/0	S	1,5	M. Klarmann, J. Blickhäuser
2571199	Open Innovation – Concepts, Methods and Best Practices	1/0	S	1,5	A. Hahn

Learning Control / Examinations

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

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

Conditions

Only one of the following courses can be counted towards the final grade of the module:

Marketing Strategy Business Game, Business Plan Workshop or Strategic Brand Management.

Qualification Goals

Students

- have an advanced knowledge about central marketing contents
- have a fundamental understanding of the marketing instruments
- know and understand several strategic concepts and how to implement them
- are able to implement their extensive marketing knowledge in a practical context
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the Marketing department

Content

The aim of this module is to deepen central marketing contents in different areas. Therefore the students can choose between the following marketing courses:

- “Product and Innovation Marketing”
- “Market Research” – this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing
- “Strategic and Behavioral Marketing”
- “Strategic and Innovative Decision Making in Marketing”
- “Business Plan Workshop”
- “Marketing and Strategy Business Game”

Remarks

The course “Open Innovation – Concepts, Methods and Best Practices” [2571199] has been added summer 2015.

Please note that only one of the following courses can be chosen in the Marketing Management Module: Marketing Strategy Business Game, Strategic Brand Management, Open Innovation – Concepts, Methods and Best Practices or Business Plan Workshop.

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

Module: Sales Management [IW4BWL MAR6]

Coordination: M. Klarmann, M. Artz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2572156	Sales Management and Retailing	2	W	3	M. Klarmann
2572157	Pricing	2/1	W	4,5	M. Klarmann
2571150	Market Research	2/1	S	4,5	M. Klarmann
2572182	Case Studies in Pricing	1	W	1,5	M. Klarmann, Mitarbeiter
2572198	Price Negotiation and Sales Presentations	1	W	1,5	M. Klarmann, M. Schröder

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

Students

- have an advanced knowledge about sales management (design and structure of sales systems, relationship with sales partners and important customers)
- have a fundamental understanding of price management (in particular consumer behavior of pricing, pricing strategy, price determination)
- are able to handle particularities and challenges in sales management
- know several qualitative and quantitative approaches to prepare decisions in Marketing
- are able to implement their extensive sales and pricing knowledge in a practical context
- have the theoretical knowledge to write a master thesis in Marketing
- have the theoretical knowledge to work in/together with the sales department

Content

The aim of the module is to deepen the sales management knowledge of the students. Theoretical approaches often have a combined view on marketing and sales, whereas in practical surroundings the sales department is completely separated from the marketing tasks. Given this fact, we concentrate on pure sales management topics and address different facets of the sales management. Students can choose between the following courses:

- "Sales Management and Retailing"
- "Pricing"
- "Market Research" - this course has to be completed successfully by students interested in seminar or master thesis positions at the chair of marketing
- "Case Studies in Pricing"
- "Sales Strategy and Control"

Remarks

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

Module: Strategy, Communication, and Data Analysis [IW4BWL MAR7]

Coordination: B. Neibecker
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2572167	Behavioral Approaches in Marketing	2/1	W	4,5	B. Neibecker
2571165	Strategic and Innovative Decision Making in Marketing	2/1	S	4,5	B. Neibecker
2571162	Information Technology and Business Information	2/1	S	4,5	B. Neibecker
2572157	Pricing	2/1	W	4,5	M. Klarmann

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

Students

- are familiar with general procedures and characteristics to develop new products and services under conditions of market orientation,
- can analyse customer needs, learn to realize competitive advantages and to work out interdisciplinary solutions,
- improve their statistic skills to cope with applied Marketing issues.

Content

The core product is everything a customer or business consumer receives. Marketers must understand what it takes to develop a new product successfully. It is important to understand that innovations differ in their degree of newness (up to radical innovations). This helps to determine how quickly the products will be adopted by a target market. Market orientation is on the front side of the medal, the reverse side includes meeting the needs of diverse stakeholders. To find out the critical drivers of success a deep understanding of analytical and statistical methods is essential. As a result, the developing of an effective marketing strategy is discussed as an empirical, scientific process. In addition, consumer behavior approaches in marketing are discussed as an important research area with a strong interdisciplinary and empirical orientation.

Remarks

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

Module: Management Accounting [IW4BWLIBU1]

Coordination: M. Wouters
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2579900	Management Accounting 1	2/2	S	4,5	M. Wouters
2579902	Management Accounting 2	2/2	W	4,5	M. Wouters

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

Students

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

Content

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

Remarks

Students who like this module are probably also interested in the courses

- 2530216 Financial Management
- 2530210 Management Accounting

5.2 Economics

Module: Applied Strategic Decisions [IW4VWL2]

Coordination: P. Reiss
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2521533	Advanced Game Theory	2/1	W	4,5	P. Reiss, C. Puppe, K. Ehrhart
2590408	Auction Theory	2/1	W	5	K. Ehrhart
2540460	Market Engineering: Information in Institutions	2/1	S	4,5	C. Weinhardt
2540489	Experimental Economics	2/1	W	4,5	C. Weinhardt, T. Teubner
2520402/ 2520403	Predictive Mechanism and Market Design	2/1	W	4,5	P. Reiss
2530214	Corporate Financial Policy	2/1	S	4,5	M. Ruckes
2530232	Financial Intermediation	3	W	4,5	M. Ruckes
2520365	Decision Theory	2/1	S	4,5	K. Ehrhart

Learning Control / Examinations

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

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

Conditions

The course *Advanced Game Theory* is obligatory. Exception: The course *Introduction to Game Theory* [2520525] was completed.

Recommendations

Basic knowledge in game theory is assumed.

Qualification Goals

Students

- can model and analyze complex situations of strategic interaction using advanced game theoretic concepts;
- are provided with essential and advanced game theoretic solution concepts on a rigorous level and can apply them to understand real-life problems;
- learn about the experimental method, ranging from designing an economic experiment to data analysis.

Content

The module provides solid skills in game theory and offers a broad range of game theoretic applications. To improve the understanding of theoretical concepts, it pays attention to empirical evidence as well.

Remarks

The course *Predictive Mechanism and Market Design* is not offered each year.

Module: Macroeconomic Theory [IW4VWL8]

Coordination: M. Hillebrand
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2520543	Theory of Economic Growth	2/1	S	4,5	M. Hillebrand
25549	Theory of Business Cycles	2/1	W	4,5	M. Hillebrand
2561503	Theory of endogenous growth	2/1	W	4,5	I. Ott

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.

Conditions

None.

Recommendations

Grundlegende mikro- und makroökonomische Kenntnisse, wie sie beispielsweise in den Veranstaltungen *Volkswirtschaftslehre I (Mikroökonomie)* [2600012] und *Volkswirtschaftslehre II (Makroökonomie)* [2600014] vermittelt werden, werden vorausgesetzt. Aufgrund der inhaltlichen Ausrichtung der Veranstaltung wird ein Interesse an quantitativ-mathematischer Modellierung vorausgesetzt.

Qualification Goals

See German version.

Content

Module: Telecommunications Markets [IW4VWL10]

Coordination: K. Mitusch
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2561232	Telecommunication and Internet Economics	2/1	W	4,5	K. Mitusch
2540462	Communications Economics	2/1	S	4,5	J. Kraemer

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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

None.

Qualification Goals

The module shall provide students with a general understanding of the economic correlations and structures of modern telecommunications markets. A broad overview over market structures, actors and relations of the different markets will be given and students shall acquire the means to analyze the interactions between different actors both qualitatively and by applying methods of industrial economics. On this basis students are able to examine practical issues from different perspectives and to assess the different practices.

Content

Accompanied by rapid technological developments the telecommunications markets have undergone substantial changes since their liberalization in the late 90s. Besides the former state-owned monopoly incumbents, a large number of new actors has established on different levels of the industry. While particularly on the service level, intensive competition has developed, some infrastructure elements still qualify as natural monopolies and are subject to regulation. With the rising number of actors, services and applications the economic correlations of these markets are getting more and more complex. Growing data volumes and technological developments give rise to new infrastructure investments. Actors have to consider direct and indirect network effects as they operate on several markets simultaneously and regulators need to keep the balance between fostering competition and incentivizing investments. The rapidly developing markets pose many issues that are worth to be discussed.

The two sector specific courses are complementary and address the most relevant aspects and economic effects that have influenced the development of telecommunications markets in the recent past and will most probably influence them in the future. For some topics the methods of industrial economics are applied, which makes the third course of the module, *Industrial Organization*, a perfect supplement to either of the two courses.

Module: Economic Theory and its Application in Finance [IW4VWL14]

Coordination: K. Mitusch
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2520527	Advanced Topics in Economic Theory	2/1	S	4,5	M. Hillebrand, K. Mitusch
2530214	Corporate Financial Policy	2/1	S	4,5	M. Ruckes
2530232	Financial Intermediation	3	W	4,5	M. Ruckes
2530555	Asset Pricing	2/1	S	4,5	M. Uhrig-Homburg, M. Ruckes

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 exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately. The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Conditions

The course „Advanced Topics in Economic Theory“ is compulsory and must be examined.

Recommendations

None.

Qualification Goals

The students

- have learnt the methods of formal economic modeling, particularly of General Equilibrium Theory and contract theory
- will be able to apply these methods to the topics in Finance, specifically the areas of financial markets and institutions and corporate finance
- have gained many useful insights into the relationship between firms and investors and the functioning of financial markets

Content

The mandatory course „Advanced Topics in Economic Theory“ is devoted in equal parts to General Equilibrium Theory and to contract theory. The course „Asset Pricing“ will apply techniques of General Equilibrium Theory to valuation of financial assets. The courses „Corporate Financial Policy“ and „Finanzintermediation“ will apply the techniques of contract theory to issues of corporate finance and financial institutions.

Module: Microeconomic Theory [IW4VWL15]

Coordination: C. Puppe
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2521533	Advanced Game Theory	2/1	W	4,5	P. Reiss, C. Puppe, K. Ehrhart
2520527	Advanced Topics in Economic Theory	2/1	S	4,5	M. Hillebrand, K. Mitusch
2520537	Social Choice Theory	2/1	S	4,5	C. Puppe
2590408	Auction Theory	2/1	W	5	K. Ehrhart

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

Conditions

None.

Recommendations

None.

Qualification Goals

Students

- are able to model practical microeconomic problems mathematically and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs.

An example of a positive question is: which regulation policy results in which firm decisions under imperfect competition? An example of a normative question is: which voting rule has appealing properties?

Content

The student should gain an understanding of advanced topics in economic theory, game theory and welfare economics. Core topics are, among others, strategic interactions in markets, cooperative and non-cooperative bargaining (Advanced Game Theory), allocation under asymmetric information and general equilibrium over time (Advanced Topics in Economic Theory), voting and the aggregation of preferences and judgements (Social Choice Theory).

Remarks

Starting summer term 2015, the lecture "Auction Theory" [2590408] can be chosen in the module.

Module: Collective Decision Making [IW4VWL16]

Coordination: C. Puppe
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25539	Mathematical Theory of Democracy	2/1	W	4,5	A. Melik-Tangyan
2520537	Social Choice Theory	2/1	S	4,5	C. Puppe
2561127	Public Management	2	W	4,5	B. Wigger, Assistenten

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.

Conditions

None.

Recommendations

None.

Qualification Goals

Students

- are able to model practical problems of the public sector and to analyze them with respect to positive and normative questions,
- understand individual incentives and social outcomes of different institutional designs,
- are familiar with the functioning and design of democratic elections and can analyze them with respect to their individual incentives.

Content

The focus of the module is on mechanisms of public decisions making, including voting and the aggregation of preferences and judgements.

Module: Experimental Economics [IW4VWL17]

Coordination: P. Reiss
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2540489	Experimental Economics	2/1	W	4,5	C. Weinhardt, T. Teubner
2520402/ 2520403	Predictive Mechanism and Market Design	2/1	W	4,5	P. Reiss
n.n.	Topics in Experimental Economics	2/1	S	4,5	P. Reiss

Learning Control / Examinations

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

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

Conditions

The course *Experimental Economics* [2540489] is compulsory and must be examined.

Recommendations

Basic knowledge in mathematics, statistics, and game theory is assumed.

Qualification Goals

Students

- are acquainted with the methods of Experimental Economics along with its strengths and weaknesses;
- understand how theory-guided research in Experimental Economics interacts with the development of theory;
- are provided with foundations in data analysis;
- design an economic experiment and analyze its outcome.

Content

The module Experimental Economics offers an introduction into the methods and topics of Experimental Economics. It also fosters and extends knowledge in theory-guided experimental economics and its interaction with theory development. Throughout the module, readings of selected papers are required.

Remarks

- The course *Advanced Game Theory* is not offered before Winter 2014/15.
- The course *Predictive Mechanism and Market Design* is not offered each year.

5.3 Operations Research

Module: Operations Research in Supply Chain Management and Health Care Management [IW4OR4]

Coordination: S. Nickel
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2550486	Facility Location and Strategic Supply Chain Management	2/1	W	4,5	S. Nickel
2550488	Tactical and Operational Supply Chain Management	2/1	S	4,5	S. Nickel
2550480	Operations Research in Supply Chain Management	2/1	W/S	4,5	S. Nickel
2550495	Operations Research in Health Care Management	2/1	W/S	4,5	S. Nickel
2550493	Hospital Management	2/0	W/S	3	S. Nickel, Hansis
2550498	Practical seminar: Health Care Management (with Case Studies)	2/1/2	W/S	7	S. Nickel
2550497	Software Laboratory: OR Models II	2/1	S	4,5	S. Nickel
2550488	Discrete-event Simulation in Production and Logistics	2/1	S	4,5	S. Nickel, S. Spieckermann
2550494	Supply Chain Management in the Process Industry	2/1	W	4,5	S. Nickel
2550484	Graph Theory and Advanced Location Models	2/1	W/S	4,5	S. Nickel
n.n.	Challenges in Supply Chain Management	3	S	4,5	R. Blackburn

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.

Conditions

See German version.

Recommendations

Basic knowledge as conveyed in the module *Introduction to Operations Research* [WI1OR] is assumed.

Qualification Goals

The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of SCM and their respective optimization problems,
- is acquainted with classical location problem models (in planes, in networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is familiar with general procedures and characteristics of Health Care Management and the possibilities for adapting mathematical models for non-profit organizations,
- 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 SCM. On the one hand, the determination of optimal locations within a supply chain is addressed. 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 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.

Health Care Management addresses specific Supply Chain Management problems in the health sector. Important applications arise in scheduling and internal logistics of hospitals.

Remarks

Some lectures and courses are offered irregularly.

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

Module: Mathematical Programming [IW4OR6]

Coordination: O. Stein
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25138	Mixed Integer Programming I	2/1	S	4,5	O. Stein
25140	Mixed Integer Programming II	2/1	W	4,5	O. Stein
2550128	Special Topics in Optimization I	2/1	W/S	4,5	O. Stein
2550126	Special Topics in Optimization II	2/1	W/S	4,5	O. Stein
2550484	Graph Theory and Advanced Location Models	2/1	W/S	4,5	S. Nickel
2550111	Nonlinear Optimization I	2/1	S	4,5	O. Stein
2550113	Nonlinear Optimization II	2/1	S	4,5	O. Stein
2550134	Global Optimization I	2/1	W	4,5	O. Stein
2550136	Global Optimization II	2/1	W	4,5	O. Stein
2550120	Convex Analysis	2/1		4,5	O. Stein
2550115	Parametric Optimization	2/1		4,5	O. Stein

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

Conditions

See German version.

Qualification Goals

The student

- names and describes basic notions for advanced optimization methods, in particular from continuous and mixed integer programming, location theory, and graph theory,
- 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,
- identifies drawbacks of the solution methods and, if necessary, is able to make suggestions to adapt them to practical problems.

Content

The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous and mixed integer decision variables, for location problems and for problems on graphs.

Remarks

The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).

For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

Module: Stochastic Modelling and Optimization [IW4OR7]

Coordination: K. Waldmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2550679	Markov Decision Models I	2/1/2	W	5	K. Waldmann
2550682	Markov Decision Models II	2/1/2	S	4,5	K. Waldmann
2550674	Quality Control I	2/1/2	W/S	4,5	K. Waldmann
25659	Quality Control II	2/1/2	W/S	4,5	K. Waldmann
25687	Optimization in a Random Environment	2/1/2	W/S	4,5	K. Waldmann
2550662	Simulation I	2/1/2	W/S	4,5	K. Waldmann
2550665	Simulation II	2/1/2	W/S	4,5	K. Waldmann
25688	OR-oriented modeling and analysis of real problems (project)	2/1/2	W/S	4,5	K. Waldmann

Learning Control / Examinations

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

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

Conditions

See German version.

Qualification Goals

The student possesses detailed knowledge in modelling, analyzing and optimizing stochastic systems in economy and engineering.

Content

Markov Decision Models I: Markov Chains, Poisson Processes.

Markov Decision Models II: Queuing Systems, Stochastic Decision Processes

Simulation I: Generation of random numbers, Monte Carlo integration, Discrete event simulation, Discrete and continuous random variables, Statistical analysis of simulated data.

Simulation II: Variance reduction techniques, Simulation of stochastic processes, Case studies.

Quality Control I: Statistical Process Control, Acceptance Sampling, Design of experiments

Quality Control II: Reliability of complex systems with and without repair, Maintenance

OR-oriented modeling and analysis of real problems: project-based modelling and analysis

Remarks

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

5.4 Statistics

Module: Mathematical and Empirical Finance [IW4STAT1]

Coordination: W. Heller
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
9	Irregular	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2521331	Stochastic Calculus and Finance	2/1	W	4,5	W. Heller, M. Safarian
2520381	Advanced Econometrics of Financial Markets	2/1	S	5	A. Nazemi
2521353	Statistical Methods in Financial Risk Management	2/1		4,5	A. Nazemi

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

Conditions

None.

Qualification Goals

See German version.

Content

Remarks

The course Portfolio and Asset Liability Management [2520357] will not be offered any more from summer term 2015 on. The examination will probably be offered latest until summer term 2014. Instead of this lecture Statistical Methods in Financial Risk Management [2521353] will be offered in winter term 2014/2015.

Module: Statistical Methods in Risk Management [IW4STAT2]

Coordination: W. Heller
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2520337	Stochastic and Econometric Models in Credit Risk Management	2/2	S	5	Y. Kim
2520375	Data Mining	2	W/S	4,5	G. Nakhaeizadeh
2520317	Multivariate Methods	2/2	S	5	W. Heller
2521353	Statistical Methods in Financial Risk Management	2/1		4,5	A. Nazemi
2521325/2521326	Statistics and Econometrics in Busi- ness and Economics	2/2	W	4,5	W. Heller

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

Conditions

None.

Qualification Goals

See German version.

Content

5.5 Informatics

Module: Computer Security [IW4INSICH]

Coordination: J. Müller-Quade
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24941	Security	3/1	S	6	D. Hofheinz
SemSich	Seminar in Security	2	W/S	3	J. Müller-Quade
24137	Signals and Codes	2	W	3	J. Müller-Quade
24629	Symmetric Encryption	2	S	3	J. Müller-Quade
24691	Cryptographic Voting Schemes	2	S	3	J. Müller-Quade

Learning Control / Examinations

Conditions

None.

Qualification Goals

The student

- knows and understands the basic commonly used algorithms, their design, correctness and efficiency analysis, implementation, documentation and application,
- can handle new algorithmic problems, using this understanding,
- can apply the mathematical approaches learned in the basic computer science and mathematics courses to solve problems. Main topics are here formal correctness arguments and a mathematical analysis of efficiency.
- deals with a restricted problem in the field of computer security within the seminar,
- analyzes and discusses the problems associated to a distinct discipline in the lectures and in the final seminar paper,
- discusses, presents and defends subject-specific arguments within a given task,
- organizes the preparation of the final papers largely independent.

Content

Theoretical and practical aspects of computer security

- Development of safety goals and classification of threats
- Presentation and comparison of different formal access control models
- Formal description of authentication systems, presentation and comparison of different authentication methods (passwords, biometrics, challenge-response protocols)
- Analysis of typical vulnerabilities in programs and web applications and development of appropriate protective methods / avoidance strategies
- Overview of opportunities for side channel attacks
- Introduction to key management and Public Key Infrastructure
- Presentation and comparison of current safety certifications
- Block ciphers, hash functions, digital signature, public key encryption and digital signatures (RSA, ElGamal), and various methods of key exchange (eg, Diffie-Hellman)
- Presentation of combinations of cryptographic modules using currently used protocols such as Secure Shell (SSH) and Transport Layer Security (TLS)

Module: Advanced Topics in Cryptography [IW4INFKRYP]

Coordination: J. Müller-Quade
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24623	Selected topics in Cryptography	2	S	3	J. Müller-Quade
WSUW	How Statistics Begins to Understand the Difference Between Cause and Effect	2	W	3	D. Janzing
24137	Signals and Codes	2	W	3	J. Müller-Quade
24629	Symmetric Encryption	2	S	3	J. Müller-Quade
24166	Provable Security in Cryptography	2	W	3	D. Hofheinz
24115	Asymmetric Encryption Schemes	2	W	3	J. Müller-Quade
24691	Cryptographic Voting Schemes	2	S	3	J. Müller-Quade
24654	Digital signatures	2	W	3	D. Hofheinz
24165	Side-Channel Attacks in Cryptography	2/0	W	3	J. Müller-Quade, Antonio Almeida

Learning Control / Examinations

Lectures will be assessed in an oral overall exam on all taken lectures according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points and cut off after the first decimal place.

Conditions

None.

Qualification Goals

The student

- will be familiar with the theoretical foundations and the basic mechanisms of computer security and cryptography.
- can understand and explain the methods of computer security and cryptography,
- will be able to read and understand the latest scientific papers,
- will be able to critically assess appropriate security solutions, and identify weaknesses / threats,
- can design an own security solution to a given problem, (eg. later in the a master's thesis).

Content

The module is intended to provide depth theoretical and practical aspects of IT security and cryptography.

- Development of safety goals and classification of threats.
- Formal description of authentication systems.
- Analysis of typical vulnerabilities in programs and web applications and development of appropriate protective methods / avoidance strategies
- Overview of opportunities for side channel attacks
- Introduction to key management and Public Key Infrastructure
- Presentation and comparison of current safety certifications.
- The current research issues from some of the following areas are covered:
 - Block ciphers, hash functions,
 - Public-key encryption, digital signature, key exchange.

- Basic security protocols such as fair coin toss over the phone, Byzantine Agreement, Dutch Flower Auctions, Zero Knowledge.
- Threat models and security definitions.
- Modular design and protocol composition.
- Security definitions of simulatability.
- Universal Composability.
- Deniability as an additional safety feature.
- Electronic Voting.

Module: Introduction to Algorithmics [IW4INEAT]

Coordination: D. Wagner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits 10	Cycle Every 2nd term, Winter Term	Duration 2
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Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24079	Algorithms II	3/1	W	6	D. Wagner, P. Sanders
24819	Algorithm Design Seminar	2	W/S	4	D. Wagner

Learning Control / Examinations**Conditions**

None.

Qualification Goals

The student

- gains basic insights into the most important areas of algorithmics,
- identifies algorithmic problems from different areas of application and can formulate these in a formal manner,
- comprehends and determines the running times of algorithms,
- knows basic algorithms and data structures and can transfer this knowledge to new problems.

Content

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

Module: Advanced Algorithms: Design and Analysis [IW4INAADA]

Coordination: D. Wagner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24171	Randomized Algorithms	2/1	W	5	T. Worsch
24602	Parallel Algorithms	2/1	W	5	P. Sanders
24123	Algorithm Engineering	2/1	S	5	P. Sanders, D. Wagner
24622	Algorithms in Cellular Automata	2/1	S	5	T. Worsch
24819	Algorithm Design Seminar	2	W/S	4	D. Wagner
AVG	Algorithms for Visualization of Graphs	2/1		5	D. Wagner
ALGTprak	Practical Course in Algorithm Design	4		6	P. Sanders, D. Wagner
24638	Algorithms for Routing	2/1	S	5	D. Wagner
AAS	Algorithms for Ad-Hoc and Sensor Networks	2/1		5	D. Wagner
ALGG	Computational Geometry	3	S	5	M. Nöllenburg, D. Wagner
2511106	Nature-inspired Optimisation Methods	2/1	S	5	P. Shukla
ALGK		2/1		5	M. Nöllenburg, D. Wagner

Learning Control / Examinations**Conditions**

None.

Qualification Goals

The student

- knows advanced methodical approaches with respect to the design and analysis of algorithms,
- can comment on theoretical aspects of algorithmics in a qualified and well-structured manner,
- identifies algorithmic problems from different areas and can formulate these formally,
- can analyze and judge the computational complexity of algorithmic problems from different areas,
- can recognize and design suitable algorithmic techniques to solve algorithmic problems.

Content

This module conveys profound knowledge concerning theoretical aspects of algorithmics. Its focus is on the design and analysis of advanced algorithms, particularly, on algorithms for graphs, randomized algorithms, parallel algorithms and algorithms for NP-hard problems.

Module: Advanced Algorithms: Engineering and Applications [IW4INAALGOB]

Coordination: D. Wagner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
ALGTprak	Practical Course in Algorithm Design	4		6	P. Sanders, D. Wagner
24123	Algorithm Engineering	2/1	S	5	P. Sanders, D. Wagner
2511104	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
2511106	Nature-inspired Optimisation Methods	2/1	S	5	P. Shukla
24638	Algorithms for Routing	2/1	S	5	D. Wagner
24602	Parallel Algorithms	2/1	W	5	P. Sanders
AVG	Algorithms for Visualization of Graphs	2/1		5	D. Wagner
24819	Algorithm Design Seminar	2	W/S	4	D. Wagner
24622	Algorithms in Cellular Automata	2/1	S	5	T. Worsch
24171	Randomized Algorithms	2/1	W	5	T. Worsch
AAS	Algorithms for Ad-Hoc and Sensor Networks	2/1		5	D. Wagner
ALGK		2/1		5	M. Nöllenburg, D. Wagner

Learning Control / Examinations**Conditions**

None.

Qualification Goals

The Student

- knows advanced methodical approaches concerning the design of algorithms and their applications,
- can comment on the practical aspects of algorithmics in a qualified and well-structured manner,
- identifies algorithmic problems from different areas of application and can formulate these formally,
- can judge the computational complexity of algorithmic problems,
- recognizes suitable algorithmic techniques for solving these problems and can transfer and apply knowledge of these techniques to new problems,
- can implement solutions based on algorithmic techniques for practical problems and can evaluate these

Content

This module conveys profound knowledge concerning practical aspects of algorithmics and covers applications of algorithms for practical problems. Its focus is on the design, the practical implementation and the evaluation of algorithms, particularly, algorithms for graphs, parallel algorithms, algorithms for NP-hard problems, optimization algorithms inspired by nature, as well as algorithms from various areas of application.

Module: Language Technology and Compiler [IW4INCOMP1]

Coordination: G. Snelting
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24661	Language Technology and Compiler	4/2	S	8	G. Snelting

Learning Control / Examinations

The assessment consists of an oral exam (approx. 30 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

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

Conditions

None.

Qualification Goals

The student

- knows the importance of language and compiler technologies in other areas of computer science
- learns the theoretical foundations and practical methods which form the foundation for the compiler passes: lexical analysis, syntactic analysis, semantic analysis, code generation and code optimization
- has received an overview over the state of the art in compiler construction
- is able to apply his knowledge in practice when constructing a compiler (e.g. In the compiler lab)

Content

- Structure of a compiler
- Lexical analysis
- Syntactic analysis
- Semantic analysis
- Code generation
- Code optimization
- Specific technologies: LL-Parser, LR/LALR-Parser, attributed grammars, instruction selection, register allocation, runtime mechanisms, memory management, static single assignment form and its usage in optimization

Module: Software Systems [IW4INSWS]

Coordination: R. Reussner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24667	Component Based Software Architecture	2	S	3	R. Reussner, Andreas Rentschler
24660	Software Development for Modern, Parallel Platforms	2	S	3	W. Tichy
24112	Multicore Computers and Computer Clusters	2	W	3	W. Tichy
24125 / 24673	Reading Group	1	W/S	1	R. Reussner
SpezVer	Specification and Verification of Software	3	W	5	B. Beckert, P. Schmitt
24293	Multicore Programming in Practice: Tools, Models, Languages	4	W	6	W. Tichy, T. Karcher, L. Rodríguez
24164	Software-Evolution	2	W	3	K. Krogmann, K. Krogmann
24187	Natural Language Processing and Software Engineering	2	W	3	W. Tichy
24657		2	W	3	R. Reussner, Lucia Kapova
24625	Applying Formal Verification	3	S	5	B. Beckert
APS	Automatic Software Parallelization	2/1	S	4	F. Padberg
rqen	Requirements Engineering		S	3	A. Koziolok

Learning Control / Examinations

The assessment consists of an oral exam on the contents of each taken lecture and practical courses (approx. 25 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

Lesegruppe Softwaretechnik: ungraded assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations.

The lecture *Multicore Programming in Practice: Tools, Models, Languages* [24293] will have a graded assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations. The assessment is explained in the course description.

The lecture *Multicore Computers and Computer Clusters* will have an assessment consists of a written exam according to section 4 subsection 2 no. 1 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

Conditions

The lecture *Multicore Programming in Practice* [24293] can **not** be taken in the study course Information Engineering and Management.

Qualification Goals

In the courses that comprise this module, students learn different approaches and techniques for systematic and high-quality development of software systems, e.g. requirements engineering, implementing components and services, use of parallelism and multi-core platforms, as well as the verification of created software systems.

Content

The content will be explained in the course descriptions.

Remarks

The lecture *Multikernpraktikum* is no longer offered.

The lecture *Praktikum Performance von Anwendungen auf Cloud-Großrechner IBM z10* is no longer offered.

The lecture *Security Engineering* is not offered any longer.

Module: Software Methods [IW4INSWM]

Coordination: R. Reussner
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24667	Component Based Software Architecture	2	S	3	R. Reussner, Andreas Rentschler
24156	Empirical Software Engineering	2	W	3	W. Tichy
24634	Modern Development Environments using the example of .NET	2	S	3	W. Tichy, Gelhausen, Ladani
24125 / 24673	Reading Group	1	W/S	1	R. Reussner
24164	Software-Evolution	2	W	3	K. Krogmann, K. Krogmann
24187	Natural Language Processing and Software Engineering	2	W	3	W. Tichy
24657		2	W	3	R. Reussner, Lucia Kapova
APS	Automatic Software Parallelization	2/1	S	4	F. Padberg
rqn	Requirements Engineering		S	3	A. Koziolk

Learning Control / Examinations

The assessment consists of an oral exam on the taken lectures and practical courses (approx. 45 minutes) according to section 4 subsection 2 no. 2 study and examination regulations.

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

Conditions

None.

Qualification Goals

The students learn the foundations and advanced methods for systematic planning, design, implementation, evaluation and enhancement of software systems. By acquiring knowledge and capabilities to critically evaluate modern technologies, the students are enabled to use these technologies purposefully and effectively. Apart from functional viewpoints and software properties, extra-functional properties such as security and performance are taught. Additionally, an overview of current research topics and challenges are offered.

Content

The content is explained in the course descriptions.

Module: Applied Web Engineering [IW4INPWE]

Coordination: H. Hartenstein
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24124	Web Engineering	2/0	W	4	H. Hartenstein, M. Nußbaumer
24880	Practical Course Web Engineering	4	W/S	5	H. Hartenstein, M. Nußbaumer, M. Keller

Learning Control / Examinations

The assessment consists of an oral exam (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The assessment is based on practical work and presentations according to § 4(2), 3 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

Conditions

None.

Recommendations

Knowledge of HTML is required, basic programming knowledge (e.g. Java, C++/C or C#, etc.) is expected.

Qualification Goals

- Students know the fundamentals as well as current methodologies and techniques in the field of Web Engineering and can apply them in practice. They have gained insights and first experiences in managing Web projects as well as in analyzing, structuring and describing problems in the field of Web Engineering.
- Students have acquired knowledge about state-of-the-art Web-based concepts, technologies and frameworks. They have developed a fundamental understanding of server- and client-side technologies and their interaction.
- Students have the ability to design Web-based systems autonomously with regard to the aspects data, interaction, navigation, presentation, communication and processing.
- Students are able to understand and interpret scientific papers and standard specifications and are confident in using the domain-specific language.

Content

The module is designed as an introduction to the discipline of Web Engineering, covering both theory and practice. The focus is on approaches and methods fostering a systematic construction of Web-based applications and systems. The different phases and aspects of the Web application lifecycle are examined as well. It helps students to look at the Web phenomenon from different perspectives - e.g. as a Web designer, analyst, architect, component engineer, program manager, product manager or CIO. Methods for dealing with requirements, design, architecture, implementation and management are discussed and applied in a project.

The module will convey practical knowledge of the Web's fundamental languages and technologies, like (X)HTML/CSS and XML/XSL. Furthermore component-based Web engineering approaches and frameworks are applied in the software project. Another thematic focus of the course is on Web services as a fundamental building block for constructing service-oriented applications. By realizing a software project, the structured and disciplined application of the learnt technologies is emphasized.

Module: Wireless Networking [IW4INWN]

Coordination: M. Zitterbart
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24104	Internet of Everything	2/0	W	4	M. Zitterbart
24669	Modeling and Simulation of Networks and Distributed Systems	2/0	S	4	H. Hartenstein
24643	Mobile Communication	2/0	W	4	O. Waldhorst, M. Zitterbart
24146	Ubiquitous Computing	2/1	W	5	M. Beigl
24601	Network Security: Architectures and Protocols	2/0	S	4	M. Schöller
24128	Telematics	3	W	6	M. Zitterbart

Learning Control / Examinations

The assessments for the individual courses consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

It is recommended to take the exams at the same time as part of an overall exam.

Conditions

The lecture *Telematics* [24128] must be taken if it has not been passed yet. If the lecture *Telematics* [24128] has not been passed yet, it has to be the first exam or examined simultaneously with the second chosen lecture.

Recommendations

Knowledge of the lecture *Introduction in Computer Networks* [24519] or *Networked IT-Infrastructures* [24074] is recommended as a basis for this module.

Qualification Goals

Each student should be able

- to learn and use the concepts and principals of wireless network design
- to identify the flaws and benefits of wireless communication systems
- to judge the performance of protocols, wireless networks and architectures
- master advanced protocols, architectures and algorithms of wireless communication systems

Content

This module details selected aspects of wireless communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

Module: Networking Labs [IW4INNL]

Coordination: H. Hartenstein
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24669	Modeling and Simulation of Networks and Distributed Systems	2/0	S	4	H. Hartenstein
24878	Practical Course Modeling and Simulation of Networks and Distributed Systems	0/2	S	5	H. Hartenstein
24149	IT-Security Management for Networked Systems	2/1	W	5	H. Hartenstein
24601	Network Security: Architectures and Protocols	2/0	S	4	M. Schöller

Learning Control / Examinations

The assessments for the individual lectures consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The assessments for practical courses will be assessments according to sec. 4 subsec. 2 no. 3 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

Conditions

- Knowledge of the lectures *Introduced in Computer Networks* [24519] or *Networked IT-Infrastructures* [24074] is recommended as a basis for this module.
- The lecture *Telematics* [24128] is presumed to be known.

One of the following combinations can be taken:

- Modeling and Simulation of Networks and Distributed Systems (24669) and Practical Course Modeling and Simulation of Networks and Distributed Systems (24878)
- Modeling and Simulation of Networks and Distributed Systems (24669) and IT-Security Management for Networked Systems (24149)
- IT-Security Management for Networked Systems (24149) and Network Security: Architectures and Protocols (24601)

Qualification Goals

Each student should be able

- to learn and apply the concepts and principals of wireless network design
- to identify the flaws and benefits of wireless communication systems
- to judge the performance of protocols, wireless networks and architectures
- master advanced protocols, architectures and algorithms of wireless communication systems

Content

This module details and applies selected aspects of communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

Remarks

If the lecture *Telematics* [24128] has not been taken yet, it has to be the first exam or examined simultaneously with the second chosen lecture.

Module: Future Networking [IW4INFN]

Coordination: M. Zitterbart
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24674	Next Generation Internet	2/0	S	4	R. Bless, M. Zitterbart
24132	Multimedia Communications	2/0	W	4	R. Bless, M. Zitterbart
24643	Mobile Communication	2/0	W	4	O. Waldhorst, M. Zitterbart
24104	Internet of Everything	2/0	W	4	M. Zitterbart
24128	Telematics	3	W	6	M. Zitterbart

Learning Control / Examinations

The assessments for the individual courses consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

It is recommended to take the exams at the same time as part of an overall exam.

Conditions

The lecture *Telematics* [24128] must be taken if it has not been passed yet. If the lecture *Telematics* [24128] has not been passed yet, it has to be the first exam or examined simultaneously with the second chosen lecture.

Recommendations

Knowledge of the lecture *Introduction in Computer Networks* [24519] or *Networked IT-Infrastructures* [24074] is recommended as a basis for this module.

Qualification Goals

Each student should be able

- to learn and use the concepts and principals of future network design
- to identify the flaws and benefits of future communication systems
- to judge the performance of protocols, future networks and architectures
- master advanced protocols, architectures and algorithms of future communication systems

Content

This module details selected aspects of future communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

Module: Networking [IW4INNW]

Coordination: M. Zitterbart
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24128	Telematics	3	W	6	M. Zitterbart
24674	Next Generation Internet	2/0	S	4	R. Bless, M. Zitterbart
24669	Modeling and Simulation of Networks and Distributed Systems	2/0	S	4	H. Hartenstein
24132	Multimedia Communications	2/0	W	4	R. Bless, M. Zitterbart
24601	Network Security: Architectures and Protocols	2/0	S	4	M. Schöller
PEprak	Lab Protocol Engineering	4	W	4	M. Zitterbart

Learning Control / Examinations

The assessments for the individual courses consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The grade of the module is the average of the single grades weighted by the related credit points.

It is recommended to take the exams at the same time as part of an overall exam.

Conditions

None.

Recommendations

Knowledge of the lecture *Introduction in Computer Networks* [24519] or *Networked IT-Infrastructures* [24074] is recommended as a basis for this module.

Qualification Goals

Each student should be able

- to learn and use the concepts and principals of wired network design
- to identify the flaws and benefits of wired communication systems
- to judge the performance of protocols, wired networks and architectures
- master advanced protocols, architectures and algorithms of wired communication systems

Content

This module details selected aspects of wired communication systems. This includes beside the requirements of secure and multimedia-based communication also the realization and controllability of large communication systems and networks. An important aspect is benchmarking and mastering the used algorithms, protocols and architectures. Also actual developments and applications are in the focus of this module.

Module: Networking Security - Theory and Praxis [IW4INntp]

Coordination: M. Zitterbart
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24601	Network Security: Architectures and Protocols	2/0	S	4	M. Schöller
24149	IT-Security Management for Networked Systems	2/1	W	5	H. Hartenstein
24629	Symmetric Encryption	2	S	3	J. Müller-Quade
24941	Security	3/1	S	6	D. Hofheinz
SemiKryp3	Seminar in Cryptography	2	W/S	3	J. Müller-Quade

Learning Control / Examinations

The assessments for the individual courses consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations. The assessment of the seminar consists of a graded assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations.

The assessment of the course *Seminar in Cryptography* [SemiKryp3] consists of a written seminar thesis and a presentation thereof according to sec. 4 subsec. 2 no. 3 study and examination regulations. The grade is the average of the weighted single grades (generally 50% seminar thesis, 50% presentation). The seminar can be taken in this module with 2 credit points. This has to be approved by the examiner.

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

The grade of the module is the average of the single grades weighted by the related credit points.

It is recommended to take the exams at the same time as part of an overall exam.

Conditions

- At least one of the following lectures has to be taken: *Network Security: Architectures and Protocols* [24601] or *IT-Security Management for Networked Systems* [24149].
- Furthermore the following lectures can be chosen from: *Symmetric encryption* [24629] or *Seminar in Cryptography* [SemiKryp2] or *Security* [24941]

Recommendations

The lecture *Security* is a basis for this module.

Qualification Goals

Each student should be able

- to recall the basic security mechanisms and theoretical foundations of networking security and cryptography
- to read and understand actual academic papers
- to judge the security level of actual security solutions
- to identify possible attacks on security solutions

Content

This module details selected aspects of networking security and cryptography in theory and praxis.

Module: Communication and Database Systems [IW4INKD]

Coordination: K. Böhm, M. Zitterbart
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24516	Database Systems	2/1	S	4	K. Böhm
24519	Introduction in Computer Networks	2/1	S	4	M. Beigl, M. Zitterbart

Learning Control / Examinations

The assessment of the lecture *Introduction in Computer Networks* consists of a written exam according to section 4 subsection 2 no. 1 study and examination regulations.

The assessment of the lecture *Database Systems* consists of a written exam according to section 4 subsection 2 no. 1 study and examination regulations.

The grade of the module is the average of the single grades weighted with the related credit points and cut off after the first decimal place.

Conditions

None.

Qualification Goals

The students will

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

Content

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

Module: Innovative Concepts of Data and Information Management [IW4INIKDI]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24114	Big Data Analytics	2/1	W	5	K. Böhm, E. Müller
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
2400020	Deployment of Database Systems	2/1	W	5	K. Böhm
24109	Datamanagement in the Cloud	2/1	W	5	K. Böhm
24141	Information integration and mobile Web applications	2	W	3	J. Mülle, A. Rashid
24605	Data Privacy Protection in Interconnected Information Systems	2	S	3	K. Böhm, Buchmann
PLV	Selling IT-Solutions Professionally	2	W/S	1,5	K. Böhm, Hellriegel
PUB	Consulting in Practice	2	W/S	1,5	K. Böhm, Stefan M. Lang
PMP	Project Management in Practice	2	W/S	1,5	K. Böhm, W. Schnober
24522		0/1	S	1	K. Böhm
24111	Mechanisms and Applications of Workflow Systems	3	W	5	J. Mülle, Silvia von Stackelberg
2400015	Indexing Structures for Efficient Query Processing on Large Databases	2	S	3	K. Böhm, E. Müller
24647	Data Mining Paradigms and Methods for Complex Databases	2/1	S	5	K. Böhm, E. Müller

Learning Control / Examinations

The assessment consists of partial examinations on the selected courses that satisfy the minimum requirement of credit points. The assessments are explained in the course descriptions.

The grade of the module is the average of the single grades weighted by the related credit points.

Conditions

None.

Recommendations

It is recommended to take the module *Communication and Database Systems* in advance.

Qualification Goals

The students

- know the research area of information systems in its various facets and are able to do scientific work in this area,
- are able to develop complex information systems on their own,
- are able to structure and manage complex projects in the field of information systems with unpredictable difficulties,
- are able to explain and to discuss complex aspects of the topics covered by this module with both experts and informed outsiders.

Content

This module aims at exposing students to modern information management, both, in 'breadth' and 'depth'. We achieve 'breadth' by means of a close inspection and comparison of different systems and their respective aims. We achieve 'depth' by means of an extensive examination of the underlying concepts and design alternatives, their assessment as well as by discussing applications.

Remarks

The courses of this module are offered irregularly. Nonetheless, it is guaranteed that the module can be passed anytime.

Module: Theory and Practice of Data Warehousing and Mining [IW4INDWMTP]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits 9	Cycle Every term	Duration 1
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Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24874	Analyzing Big Data - Laboratory Course	2	S	4	K. Böhm
24114	Big Data Analytics	2/1	W	5	K. Böhm, E. Müller
2400020	Deployment of Database Systems	2/1	W	5	K. Böhm
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
24109	Datamanagement in the Cloud	2/1	W	5	K. Böhm
2400015	Indexing Structures for Efficient Query Processing on Large Databases	2	S	3	K. Böhm, E. Müller
24647	Data Mining Paradigms and Methods for Complex Databases	2/1	S	5	K. Böhm, E. Müller

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the selected lecture (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The practical course requires an additional certificate following sec. 4 subsec. 2 no. 3 study and examination regulations.

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

Conditions

At least one practical course has to be taken.

Recommendations

It is recommended to take the lecture *Data Warehousing and Mining* [24118] if it has not been taken yet.

Qualification Goals

The students

- know the research area of information systems in its various facets and are able to do scientific work in this area,
- are able to explain and to discuss complex aspects of the topics covered by this module with both experts and informed outsiders,
- know the concepts, algorithms, techniques and selected tools in the areas of data warehousing and data mining,
- are familiar with the practical challenges of data analysis and are able to develop respective solutions on their own.

Content

This module aims at exposing students to modern information management, both, in 'breadth' and 'depth'. We achieve 'breadth' by means of a close inspection and comparison of different systems and their respective aims. We achieve 'depth' by means of an extensive examination of the underlying concepts and design alternatives, their assessment as well as by discussing applications. In particular, we look at data warehousing and mining techniques not only from a theoretical point of view but deploy and realise such technologies in a practical course.

Remarks

The courses of this module are offered irregularly. Nonetheless, it is guaranteed that the module can be passed anytime.

Module: Theory and Practice of Database Technology [IW4INDBTP]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24286	Practical Course Database Systems	2	W	4	K. Böhm
praktvd	Practical Course Distributed Data Management	2	W	4	K. Böhm
24109	Datamanagement in the Cloud	2/1	W	5	K. Böhm
24114	Big Data Analytics	2/1	W	5	K. Böhm, E. Müller
2400020	Deployment of Database Systems	2/1	W	5	K. Böhm
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
2400015	Indexing Structures for Efficient Query Processing on Large Databases	2	S	3	K. Böhm, E. Müller
24647	Data Mining Paradigms and Methods for Complex Databases	2/1	S	5	K. Böhm, E. Müller

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the selected lecture (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The practical course requires an additional certificate following sec. 4 subsec. 2 no. 3 study and examination regulations.

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

Conditions

One of the practical courses has to be taken.

Qualification Goals**Content**

This module aims at exposing students to modern information management, both, in 'breadth' and 'depth'. We achieve 'breadth' by means of a close inspection and comparison of different systems and their respective aims. We achieve 'depth' by means of an extensive examination of the underlying concepts and design alternatives, their assessment as well as by discussing applications. In particular, we look at the topics of this module not only from a theoretical point of view but deploy and realise the respective technologies in a practical course.

Remarks

The courses of this module are offered irregularly. Nonetheless, it is guaranteed that the module can be passed anytime.

Module: Dynamic IT-Infrastructures [IW4INDITI]

Coordination: H. Hartenstein
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24669	Modeling and Simulation of Networks and Distributed Systems	2/0	S	4	H. Hartenstein
24146	Ubiquitous Computing	2/1	W	5	M. Beigl
24878	Practical Course Modeling and Simulation of Networks and Distributed Systems	0/2	S	5	H. Hartenstein
24149	IT-Security Management for Networked Systems	2/1	W	5	H. Hartenstein
24074	Data and Storage Management	2	W	4	B. Neumair
INS	Integrated Network and Systems Management	2	S	4	B. Neumair
24617	Parallel computer systems and parallel programming	2/0	S	4	A. Streit
2400050	Distributed Computing	2	W	4	A. Streit

Learning Control / Examinations

The assessments of the lectures consist of oral exams (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The assessments for practical courses and seminars will be graded assessments according to sec. 4 subsec. 2 no. 3 study and examination regulations.

The grade of the module is the average of the single grades weighted equally.

Conditions

The *Practical Course Modeling and Simulation of Networks and Distributed Systems* can only be taken if the lecture *Modeling and Simulation of Networks and Distributed Systems* is taken as well.

Recommendations

Knowledge of the lecture *Introduction in Computer Networks* [24519] is recommended as a basis for this module.

Qualification Goals

The students will get to know established as well as novel concepts for the design, implementation, operation and management of dynamic IT infrastructures (Web, Grid, Cloud, Internet):

- Getting to know established and novel concepts for IT infrastructures
- Application of methods for the evaluation and analysis of dynamic IT infrastructures
- Assessment of tools, protocols and procedures for the operation and management of dynamic IT infrastructures
- Assessment of the strengths and weaknesses of IT infrastructures
- Insight into the practical operation of dynamic IT infrastructures using the example of the operation within the Steinbuch Centre for Computing (SCC)

Content

This module covers various aspects of dynamic IT infrastructures such as layout, design, concept, development, operation and performance evaluation as well as optimization. These topics are considered from a theoretical-analytical approach as well as from the perspective of the practical experiences of day-to-day use. Being a modern IT service provider, the *Steinbuch Centre for Computing (SCC)* serves as object of study, since it combines both aspects in real life.

Module: Biosignal Processing [IW4INBSV]

Coordination: T. Schultz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24105	Biosignals and User Interfaces	4	W	6	T. Schultz, C. Herff, D. Heger
24600	Multilingual Human-Machine Communication	4	S	6	T. Schultz, F. Putze
24612	Cognitive Modeling	2	S	3	T. Schultz, F. Putze
24103	Design and Evaluation of innovative user interfaces	2	W	3	T. Schultz, F. Putze, M. Georgi
BCI	Brain-Computer Interfaces	2	S	3	T. Schultz, C. Herff, D. Heger

Learning Control / Examinations

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

The grade of the module is the average of the single grades weighted by the related credit points.

For appointments please e-mail helga.scherer@kit.edu.

It is recommended to schedule an appointment well in advance.

Conditions

One of the lectures *Biosignals and User Interfaces* or *Multilingual Human-Machine Communication* must be part of the exam.

Qualification Goals

- Introduction to biosignals, especially speech, motion, brain and muscle activity
- Foundations of production and recording of biosignals
- Foundations of automatic recognition and interpretation of biosignals
- Theory of biosignal processing
- Theory of statistical modeling
- Knowledge of the current state of the art in research and development
- Knowledge of many real-world applications
- Assessment of the potential, challenges and limitations of biosignals for human-machine interaction

Content

This module introduces students to the foundations and applications of automatic recording, processing and interpretation of biosignals. The production of biosignals will be explained, followed by methods for recording and preprocessing. Furthermore, the lecture will explain the foundations of statistical modeling as it is used in current systems. Many examples illustrate the practical application for human-machine interaction.

Module: Speech Processing [IW4INSV]

Coordination: T. Schultz
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits 9	Cycle Every term	Duration 1
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Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24145	Principles of Automatic Speech Recognition	4	W	6	A. Waibel, Sebastian Stüker
24600	Multilingual Human-Machine Communication	4	S	6	T. Schultz, F. Putze
24298	Practical Course Automatic Speech Recognition	2	W	3	A. Waibel, Stüker
24103	Design and Evaluation of innovative user interfaces	2	W	3	T. Schultz, F. Putze, M. Georgi
mse	Seminar: Multilingual Speech Recognition	2	W	3	A. Waibel, S. Stüker, M. Müller
NNsem	Seminar: Neural Networks and Artificial Intelligence	2	W	3	A. Waibel, T. Asfour, J. Gehring, S. Stüker
2400007	Natural Language Processing and Dialog Modeling	2	W	3	J. Niehues, M. Schmidt, L. Zhang, A. Waibel

Learning Control / Examinations

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

The grade of the module is the average of the single grades weighted by the related credit points.

Practical course *Automatic Speech Recognition*: In addition the student needs to submit a certificate (not graded) as an assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations.

For appointments please e-mail helga.scherer@kit.edu. It is recommended to schedule an appointment well in advance.

Conditions

None.

Qualification Goals

- Introduction to the processing of natural speech
- Theory of signal processing
- Theory of statistical modeling of speech
- Foundations of machine learning methods for speech processing
- Knowledge of the current state of the art in research and development
- Knowledge of many real-world applications
- Assessment of the potential, challenges and limitations of speech processing for human-machine interaction and human-human communication.

Content

This module introduces students to the foundations and applications of automatic speech recognition and processing. The lecture will explain the foundations of statistical modeling of speech as it is used in current systems. Many examples from state of the art systems illustrate the practical application for human-machine interaction and human-human communication.

Remarks

Lecture slides are available as pdf at <http://csl.anthropomatik.kit.edu>.

Current literature will be announced in the lectures, seminars and practical courses.

Module: Curves and Surfaces [IW4INKUF]

Coordination: H. Prautzsch
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
KFCAD2	Curves and Surfaces in CAD I	2	S	3	H. Prautzsch
CFD2	Curves and Surfaces in CAD II	2	W	3	H. Prautzsch
KFCAD3	Curves and Surfaces in CAD III	2	W/S	3	H. Prautzsch
rsp	Rationale Splines	2 oder 2/1	W	3 oder 5	H. Prautzsch
24626	Subdivision algorithms	2	W	3	H. Prautzsch
24122	Meshes and point clouds	2	W	3	H. Prautzsch
ADG	Applied Differential Geometry	2	W	3	H. Prautzsch
GGG	Geometric basics for Geometry Pro- cessing	2	W	3	H. Prautzsch

Learning Control / Examinations

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

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

Conditions

None.

Qualification Goals

Gaining knowledge and deeper understanding in the area of Computer Aided Geometric Design (CAGD) and Geometric Computing.

Further, this module should enable the students to master typical CAGD tasks and to work on a master's thesis, in particular.

Content

Technics and algorithms for generating, representing, reconstructing, modifying, animating and analyzing free form geometries (curves, surfaces and bodies).

Remarks

Some courses are not offered every year, see <http://i33www.ira.uka.de/pages/Lehre/VertiefungsgebietComputergraphik.html>

Module: Context Sensitive Systems [IN4INKUS]

Coordination: M. Beigl
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24658	Context Sensitive Systems	2	S	4	M. Beigl
24895	Practical Course: Context Sensitive ubiquitous Systems	4	S	5	M. Beigl
24844	Seminar: Ubiquitous Systems	2	W/S	4	M. Beigl
24146	Ubiquitous Computing	2/1	W	5	M. Beigl
24696	Reading Group Context Sensitive Systems	1	S	1	M. Beigl

Learning Control / Examinations

Conditions
None.

Qualification Goals

Content

Module: Human-Machine-Interaction [IW4INMMI]

Coordination: M. Beigl
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24844	Seminar: Ubiquitous Systems	2	W/S	4	M. Beigl
24875	Practical Course: Sensor-based HCI Systems	4	S	5	M. Beigl
24659	Human-Machine-Interaction	2	S	4	M. Beigl, Takashi Miyaki
24146	Ubiquitous Computing	2/1	W	5	M. Beigl
24697	Reading Group Human-Machine- Interaction	1	S	1	M. Beigl
24648	Design Principles for Interactive Real- Time Systems"	2	S	3	E. Peinsipp-Byma, O. Sauer

Learning Control / Examinations

Conditions
None.

Qualification Goals**Content**

Module: Algorithms in Computer Graphics [IW4INACG]

Coordination: H. Prautzsch
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24122	Meshes and point clouds	2	W	3	H. Prautzsch
24173	Medical Simulation Systems I	2	W	3	R. Dillmann, Speidel
24676	Medical Simulation Systems II	2	S	3	R. Dillmann, Unterhinninghofen, Suwelack
24175	Geometric Optimization	2	W	3	H. Prautzsch
ALGG	Computational Geometry	3	S	5	M. Nöllenburg, D. Wagner
24626	Subdivision algorithms	2	W	3	H. Prautzsch
24884	Practical course: Geometric Modeling	2	S	3	H. Prautzsch, Diziol
ALGK		2/1		5	M. Nöllenburg, D. Wagner

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the taken lectures and practical courses (approx. 40 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

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

Conditions

None.

Qualification Goals

Fundamental knowledge in the area of geometric modelling and computer graphics with its applications in CAD/CAGD and medical simulation.

Content

Module: Foundations and Application of IT-Security [IW4INGAS]

Coordination: J. Müller-Quade
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24941	Security	3/1	S	6	D. Hofheinz
SemiKryp2	Seminar in Cryptography	2	W/S	2	J. Müller-Quade

Learning Control / Examinations**Conditions**

None.

Qualification Goals

The student

- knows the theoretic background and the basic mechanisms of computer security and cryptography
- understands the mechanisms of computer security and can explain them,
- can read and understand the current scientific papers,
- can evaluate the safety procedures and can recognize hazards,
- can adapt mechanisms of computer security to new environment.
- deals with a restricted problem in the field of cryptography within the seminar,
- analyzes and discusses the problems associated to a distinct discipline in the lectures and in the final seminar paper,
- discusses, presents and defends subject-specific arguments within a given task,
- organizes the preparation of the final papers largely independent.

Content

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

Module: Parallel Processing [IW4INPV]

Coordination: W. Karl
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24161	Microprocessors II	2	W	3	W. Karl
24117	Heterogeneous Parallel Computing Systems	2	W	3	W. Karl
24660	Software Development for Modern, Parallel Platforms	2	S	3	W. Tichy
24112	Multicore Computers and Computer Clusters	2	W	3	W. Tichy
24606	Models of Parallel Processing	3	S	5	T. Worsch
24622	Algorithms in Cellular Automata	2/1	S	5	T. Worsch
24293	Multicore Programming in Practice: Tools, Models, Languages	4	W	6	W. Tichy, T. Karcher, L. Rodríguez
24602	Parallel Algorithms	2/1	W	5	P. Sanders
APS	Automatic Software Parallelization	2/1	S	4	F. Padberg
ASH	Algorithms for Memory Hierarchies	2		5	P. Sanders, N. Sitchinava

Learning Control / Examinations

The assessment consists of oral exams of the taken courses according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The lecture *Multicore Programming in Practice: Tools, Models, Languages* [24293] will have an assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations. The assessment is explained in the course description.

The lecture *Multicore Computers and Computer Clusters* will have an assessment consists of a written exam according to section 4 subsection 2 no. 1 study and examination regulations.

Lecture *Parallel Algorithms*: The assessment consists of an oral exam according to sec. 4 subsec. 2 no. 2 study and examination regulations and an assessment according to sec. 4 subsec. 2 no. 3 study and examination regulations. Weighted 80 %, 20 %

The grade of the module is the average of the single grades weighted by the related credit points.

Conditions

The lecture *Multicore Programming in Practice* can not be taken in the study course Information Engineering and Management.

Qualification Goals**Content**

Module: Web Engineering [IW4INWEBE]

Coordination: H. Hartenstein
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Learning Control / Examinations

The assessment consists of an oral exam (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

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

Conditions

None.

Qualification Goals

- Students know fundamentals as well as current methodologies and techniques in the field of Web Engineering
- Students have gained insight into existing Web-oriented application platforms and development frameworks, and have the basic knowledge for system design close to current practices.
- Students can apply methods for analyzing current standards and technologies of the Web. Students are able to understand and interpret scientific papers and standard specifications and are confident in using the domain-specific terminology.
- Students are able to analyze, structure and describe problems in the field of Web Engineering as well as to design Web-based system architectures.

Content

This module will discuss the systematic construction of Web-based applications and systems by focusing on the different phases and aspects of the Web application lifecycle. It helps students to look at the Web phenomenon from different perspectives - e.g. as a Web designer, analyst, architect, component engineer, program manager, product manager or CIO. Students learn how to engineer Web applications and agile systems from requirements engineering, planning, design, development, testing, deployment and up to operation, maintenance and evolution. Many examples are shown and discussed, demonstrating the need for expecting change and staying agile. As this is not a programming course, students will be introduced to the core technology aspects and are encouraged to consolidate the details.

Module: Autonomous Robotics [IN4INAR]

Coordination: R. Dillmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24152	Robotics I – Introduction to robotics	2	W	3	R. Dillmann, S. Schmidt-Rohr
24712	Robotics II - Learning and planning robots	2	S	3	R. Dillmann
24635	Robotik III - Sensors in Robotics	2	S	3	R. Dillmann, Meißner, Gonzalez, Aguirre
24619	Biologically Inspired Robot	2	S	3	R. Dillmann, Arne Rönnau
2400077	Mechano-Informatics and Robotics	4	W	4	T. Asfour
24644	Anthropomatics: Humanoid Robotics	2	S	3	T. Asfour

Learning Control / Examinations

Conditions
None.

Qualification Goals

Content

Module: Web Data Management [IW4INAIFB4]

Coordination: R. Studer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25070p	Advanced Lab Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, R. Studer
2511310	Semantic Web Technologies	2/1	S	5	R. Studer, A. Harth

Learning Control / Examinations

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

Conditions

The lecture *Semantic Web Technologies* [2511310] is obligatory and has to be absolved.

Qualification Goals

Students

- develop ontologies for semantic web technologies und choose suitable representation languages,
- are able to provide data and applications via a cloud-based infrastructure
- transfer the methods and technologies of semantic web technologies and cloud computing to new application sectors,
- evaluate the potential of semantic web technologies and the cloud computing approaches for new application sectors.

Content

The module Web Data Management covers the basic principles, methods and applications for intelligent systems in the World Wide Web. Cloud Services are essential for the decentralized, scalable provision of data and applications as well as the methods of semantic web based on the description of data and services via metadata in form of so called ontologies.

Formal principles and practical aspects such as knowledge modeling and available representation language tools for ontologies are covered in detail. Methods for the realization of intelligent systems within the World Wide Web are treated and applications as in Web 2.0 or Service Science are discussed and evaluated.

Furthermore the application of modern Cloud technologies for the use of software and hardware as a service via internet is introduced. Cloud technologies allow the efficient implementation of applications on distributed computer clusters and permit a high scalability as well as new business models in the internet.

Module: Intelligent Systems and Services [IW4INAIFB5]

Coordination: R. Studer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2511302	Knowledge Discovery	2/1	W	5	R. Studer
2511308	Service Oriented Computing 2	2/1	S	5	R. Studer, S. Agarwal, B. Norton
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	R. Studer
2511102	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
2511202	Database Systems and XML	2/1	W	5	A. Oberweis
25070p	Advanced Lab Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, R. Studer

Learning Control / Examinations

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

Conditions

None.

Qualification Goals

Students

- know the different machine learning procedures for the supervised as well as the unsupervised learning,
- identify the pros and cons of the different learning methods,
- apply the discussed network learning methods in specific scenarios,
- compare the practicality of methods and algorithms with alternative approaches.

Content

In the broader sense learning systems are understood as biological organisms and artificial systems which are able to change their behavior by processing outside influences. Network learning methods based on symbolic, statistic and neuronal approaches are the focus of Computer Sciences.

In this module the most important network learning methods are introduced and their applicability is discussed with regard to different information sources such as data texts and images considering especially procedures for knowledge acquirement via data and text mining, natural analogue procedures as well as the application of organic learning procedures within the finance sector.

Module: Semantic Technologies [IW4INAIFB6]

Coordination: R. Studer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
8	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25070s	Seminar in Applied Informatics	2	W/S	3	A. Oberweis, H. Schmeck, R. Studer
25070p	Advanced Lab Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, R. Studer
2511310	Semantic Web Technologies	2/1	S	5	R. Studer, A. Harth

Learning Control / Examinations

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

Conditions

None.

Qualification Goals

The student

- understands the concepts behind Semantic Web and Linked Data technologies
- develops ontologies to be employed in semantic web-based applications and chooses suitable representation languages,
- is familiar with approaches in the area of knowledge representation and modelling,
- is able to transfer the methods and technologies of semantic web technologies to new application sectors,
- evaluates the potential of semantic web for new application sectors,
- understands the challenges in the areas of Data and system integration on the web is able to develop solutions.

Content

Module: Ubiquitous Computing [IW4INAIFB7]

Coordination: H. Schmeck
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24146	Ubiquitous Computing	2/1	W	5	M. Beigl
2511102	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
2511104	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
24149	IT-Security Management for Networked Systems	2/1	W	5	H. Hartenstein
24146p	Advanced Lab in Ubiquitous Computing	2/0	W/S	4	H. Schmeck

Learning Control / Examinations

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

Conditions

None.

Qualification Goals**Content**

Module: Organic Computing [IW4INAIFB8]

Coordination: H. Schmeck
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2511104	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
2511106	Nature-inspired Optimisation Methods	2/1	S	5	P. Shukla
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	H. Schmeck
25070p	Advanced Lab Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, R. Studer

Learning Control / Examinations

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

Conditions

None.

Qualification Goals**Content**

Module: Development of Business Information Systems [IW4INAIFB11]

Coordination: A. Oberweis
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2511202	Database Systems and XML	2/1	W	5	A. Oberweis
2511208	Software Quality Management	2/1	S	5	A. Oberweis
2511218	Requirements Analysis and Requirements Management	2/0	W	4	R. Kneuper
2511404	IT Complexity in Practice	2/1	W	5	D. Seese, Kreidler
2511212	Document Management and Groupware Systems	2	S	4	S. Klink
2511602	Strategic Management of Information Technology	2/1	S	5	T. Wolf
2511214	Management of IT-Projects	2/1	S	5	R. Schätzle
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	A. Oberweis
25070p	Advanced Lab Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, R. Studer

Learning Control / Examinations

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

Conditions

*The course **Datenbanksysteme und XML** [2511202] or the course **Software Quality Management** [2511208] must be examined.*

Qualification Goals

Students

- describe the structure and the components of enterprise information systems,
- explain functionality and architecture of the enterprise information system components ,
- choose and apply relevant components to solve given problems in a methodic approach,
- describe roles, activities and products in the field of software engineering management,
- compare process and quality models and choose an appropriate model in a concrete situation,
- write scientific theses in the areas of enterprise information system components and software engineering management and find own solutions for given problems and research questions.

Content

An enterprise information system contains the complete application software to store and process data and information in an organisation including design and management of databases, workflow management and strategic information planning. Due to global networking and geographical distribution of enterprises as well as the increasing acceptance of eCommerce the application of distributed information systems becomes particular important. This module teaches concepts and methods for design and application of information systems.

Module: Fundamentals of Robotics [IW4INROB]

Coordination: R. Dillmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the taken lectures (approx. 45-60 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

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

The exam can be taken every semester during the lecture period.

Conditions

The course *Robotics I – Introduction to robotics* [24152] has to be taken, the remaining lectures can be chosen freely from the offered courses.

Recommendations

Previous attendance in practical courses offered at the institute is recommended to gain practical experiences in different areas of robotics, complementing and deepening the theoretical knowledge from lectures.

Qualification Goals

Students gain knowledge about the essential components of robotic systems and robotic controllers and their interaction. They shall have the ability to identify the different problems in a robotic system and have knowledge on solution approaches and applicable methods. They shall be able to choose appropriate components for simple applications and to choose appropriate designs for these components based on the intended application.

Content

The module provides an overview of the domain of robotics with its different tasks, problems and subproblems. It covers industrial robots in industrial production as well as service robots. The emphases are in the areas of robot control, perception, modeling and programming

Remarks

To sign up please send an e-mail to: sekrdill@anthropomatik.kit.edu

It is recommended to schedule an appointment well in advance.

Module: Medical Simulation and Neural Medicine [IW4INMSNM]

Coordination: R. Dillmann
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24173	Medical Simulation Systems I	2	W	3	R. Dillmann, Speidel
24676	Medical Simulation Systems II	2	S	3	R. Dillmann, Unterhinninghofen, Suwelack
24139 / 24678	Human brain and central nervous system: anatomy, information transfer, signal processing, neurophysiology and therapy	2	W/S	3	U. Spetzger

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the taken lectures (approx. 30-40 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

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

The exam can be taken every semester during the lecture period.

To sign up please send an e-mail to: sekretariat.dillmann@ira.uka.de

It is recommended to schedule an appointment well in advance.

Conditions

Attendance of the lab classes and seminars on medical informatics offered by the institute is recommended since they offer the opportunity to extend theoretical and practical skills.

Recommendations

Attendance of the lab classes and seminars on medical informatics offered by the institute is recommended since they offer the opportunity to extend theoretical and practical skills.

Qualification Goals

On completion of this module students will know the essential components of medical simulation systems and their interaction. The objective is a basic methodological understanding regarding the identification of different problems as-well-as imparting knowledge of fundamental solution approaches for the design of medical simulation systems. The lecture aims to impart the competence to conceive dedicated systems and to make important design decisions correctly.

Students will have an understanding of construction and the complex functions of the human brain and the central nerve system. The basic principles of neural physiology are conveyed. Furthermore, diagnostic procedures are presented, with a focus on computer assisted and robot assisted surgical procedures.

Content

The module gives an overview of medical simulation systems and gives insight into applications of computer science to medical problems. Focus is on the fields of imaging and image processing, intra-operative assistance systems, and modeling and simulation of biological systems.

Furthermore, an overview on neural medicine and a basic understanding of physiology regarding senses and nerves is conveyed, which are an important interface to the innovative research area of neural prosthodontics. A close connection to the areas of imaging, image processing and operative support systems is shown. Concrete application examples from medical diagnosis and therapy are presented.

Module: Automated visual inspection [IW4INAS]

Coordination: J. Beyerer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24169	Automated Visual Inspection and Image Processing	4	W	6	J. Beyerer
24675	Pattern Recognition	2	S	3	J. Beyerer
24172	Introduction to Information Fusion	2	W	3	M. Heizmann
BAFsem	Seminar Image Analysis and Fusion	2	S	3	J. Beyerer
24150	Machine Learning 1 - Basic Methods	2	W	3	R. Dillmann, J. Zöllner, Bär, Lösch
2400060	Image Data Compression	2	W	3	A. Pak, J. Beyerer

Learning Control / Examinations

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

Conditions

The course *Automated Visual Inspection and Image Processing* has to be taken.

Qualification Goals**Content**

Module: Machine Vision [IW4INMVW]

Coordination: J. Beyerer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24169	Automated Visual Inspection and Image Processing	4	W	6	J. Beyerer
24675	Pattern Recognition	2	S	3	J. Beyerer
24172	Introduction to Information Fusion	2	W	3	M. Heizmann
24684	Introduction to Video Analysis	2	S	3	J. Beyerer, Arens
24180	Computer Vision for Human-Computer Interaction	4	W	6	R. Stiefelhagen
24628	Content-based Image and Video Retrieval	2	S	3	R. Stiefelhagen, Hazim Ekenel
24893	Practical Course Computer Vision for Human-Computer Interaction	2	S	3	R. Stiefelhagen, Manuel Martinez
2400060	Image Data Compression	2	W	3	A. Pak, J. Beyerer
2403011	Biomedic Systems for Person Identification	2	S	3	M. Saquib Sarfraz

Learning Control / Examinations

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

Conditions

At least one course offered by the chair of Beyerer has to be taken.

Qualification Goals**Content**

Module: Automated Planning and Decision-making [IW4INAPE]

Coordination: J. Beyerer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24675	Pattern Recognition	2	S	3	J. Beyerer
BAFsem	Seminar Image Analysis and Fusion	2	S	3	J. Beyerer
24603	Probabilistic Planning	4	S	6	J. Beyerer, Marco Huber

Learning Control / Examinations

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

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

Conditions

The course *Probabilistische Planung* has to be taken.

Qualification Goals**Content**

Module: Image-based detection and classification [IN3INBDK]

Coordination: J. Beyerer
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24675	Pattern Recognition	2	S	3	J. Beyerer
24169	Automated Visual Inspection and Image Processing	4	W	6	J. Beyerer
24172	Introduction to Information Fusion	2	W	3	M. Heizmann
24684	Introduction to Video Analysis	2	S	3	J. Beyerer, Arens
BAFsem	Seminar Image Analysis and Fusion	2	S	3	J. Beyerer
24150	Machine Learning 1 - Basic Methods	2	W	3	R. Dillmann, J. Zöllner, Bär, Lösch
24620	Machine Learning 2 – Advanced methods	2	S	3	J. Zöllner, R. Dillmann, M. Lösch, T. Bär
2400060	Image Data Compression	2	W	3	A. Pak, J. Beyerer

Learning Control / Examinations

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

Conditions

The course *Pattern Recognition* has to be taken.

Qualification Goals**Content**

Module: Entrepreneurship for Computer Scientists [IW4INUKI]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24114	Big Data Analytics	2/1	W	5	K. Böhm, E. Müller
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
2400020	Deployment of Database Systems	2/1	W	5	K. Böhm
24109	Datamanagement in the Cloud	2/1	W	5	K. Böhm
24141	Information integration and mobile Web applications	2	W	3	J. Mülle, A. Rashid
24605	Data Privacy Protection in Interconnected Information Systems	2	S	3	K. Böhm, Buchmann
PLV	Selling IT-Solutions Professionally	2	W/S	1,5	K. Böhm, Hellriegel
PUB	Consulting in Practice	2	W/S	1,5	K. Böhm, Stefan M. Lang
PMP	Project Management in Practice	2	W/S	1,5	K. Böhm, W. Schnober
24522		0/1	S	1	K. Böhm
24111	Mechanisms and Applications of Workflow Systems	3	W	5	J. Mülle, Silvia von Stackelberg
2400015	Indexing Structures for Efficient Query Processing on Large Databases	2	S	3	K. Böhm, E. Müller

Learning Control / Examinations**Conditions**

None.

Qualification Goals**Content**

Module: Theory and Practice of Big Data Analytics [IW4INADTP]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24874	Analyzing Big Data - Laboratory Course	2	S	4	K. Böhm
24114	Big Data Analytics	2/1	W	5	K. Böhm, E. Müller
2400020	Deployment of Database Systems	2/1	W	5	K. Böhm
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
24109	Datamanagement in the Cloud	2/1	W	5	K. Böhm
2400015	Indexing Structures for Efficient Query Processing on Large Databases	2	S	3	K. Böhm, E. Müller
24647	Data Mining Paradigms and Methods for Complex Databases	2/1	S	5	K. Böhm, E. Müller

Learning Control / Examinations

The assessment consists of an oral exam on the contents of the selected lecture (approx. 20 minutes) according to sec. 4 subsec. 2 no. 2 study and examination regulations.

The practical course requires an additional certificate following sec. 4 subsec. 2 no. 3 study and examination regulations.

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

Conditions

At least one practical course has to be taken.

Recommendations

It is recommended to take the lecture *Theory and Practice of Big Data Analytics* [24118] if it has not been taken yet.

Qualification Goals

Content

Module: [IN4INDPMD]

Coordination: K. Böhm
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Informatics

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24647	Data Mining Paradigms and Methods for Complex Databases	2/1	S	5	K. Böhm, E. Müller

Learning Control / Examinations

Conditions
None.

Qualification Goals

Content

5.6 Law

Module: Intellectual Property Law [IW4JURA4]

Coordination: T. Dreier
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24354	Internet Law	2/0	W	3	T. Dreier
24121	Copyright	2/0	W	3	T. Dreier
24656	Patent Law	2/0	S	3	P. Bittner
24136 / 24609	Trademark and Unfair Competition Law	2/0	W/S	3	Y. Matz
VGE	Computer Contract Law	2/0	W	3	M. Bartsch

Learning Control / Examinations

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

Conditions

None.

Qualification Goals

See German version.

Content

Module: Private Business Law [IW4JURA5]

Coordination: Z. (ZAR)
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24650	Civil Law for Advanced	2/0	S	3	Z. (ZAR)
24671	Law of Contracts	2/0	S	3	Z. (ZAR)
24167	Employment Law I	2	W	3	A. Hoff
24668	Employment Law II	2	S	3	A. Hoff
24168	Tax Law I	2/0	W	3	D. Dietrich
24646	Tax Law II	2/0	S	3	D. Dietrich

Learning Control / Examinations

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

Conditions

None.

Recommendations

For the courses

- *Civil Law for Advanced* [24650]
- *Law of Contracts* [24671],

basic knowledge in civil law as taught in the courses *Civil Law for Beginners* [24012], *Advanced Civil Law* [24504], and *Commercial and Corporate Law* [24011] is required.

Qualification Goals

The student

- has gained in-depth knowledge of German company law, commercial law and civil law;
- is able to analyze, evaluate and solve complex legal and economic relations and problems;
- is well grounded in individual labour law, collective labour law and commercial constitutional law, evaluates and critically assesses clauses in labour contracts;
- recognizes the significance of the parties to collective labour agreements within the economic system and has differentiated knowledge of labour disputes law and the law governing the supply of temporary workers and of social law;
- possesses detailed knowledge of national earnings and corporate tax law and is able to deal with provisions of tax law in a scientific manner and assesses the effect of these provisions on corporate decision-making.

Content

The module provides the student with knowledge in special matters in business law, like employment law, tax law and business law, which are essential for managerial decisions.

Module: Public Business Law [IW4JURA6]

Coordination: G. Sydow
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24632	Telecommunications Law	2/0	S	3	G. Sydow
24082	Public Media Law	2	W	3	C. Kirchberg
24666	European and International Law	2/0	S	3	G. Sydow
24140	Environmental Law	2	W	3	G. Sydow
24018	Data Protection Law	2/0	W	3	G. Sydow

Learning Control / Examinations

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

Conditions

None.

Qualification Goals

See German version.

Content

Module: Governance, Risk & Compliance [IW4JURGRC]

Coordination: T. Dreier
Degree programme: Informationswirtschaft (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24121	Copyright	2/0	W	3	T. Dreier
24018	Data Protection Law	2/0	W	3	G. Sydow
24168	Tax Law I	2/0	W	3	D. Dietrich
24671	Law of Contracts	2/0	S	3	Z. (ZAR)
GRC	Corporate Compliance	2	W	3	T. Dreier, N.N.
GRCsem	Seminar: Governance, Risk & Compliance	2	S	3	T. Dreier, N.N.

Learning Control / Examinations**Conditions**

None.

Qualification Goals**Content**

6 Anhang: Qualifikationsziele Informationswirtschaft (M.Sc.)

Die Absolventen/innen des interdisziplinären, viersemestrigen Masterstudiengangs Informationswirtschaft verfügen über ein erweitertes und vertieftes forschungsorientiertes Fachwissen in den Bereichen Informatik, Wirtschaftswissenschaften und Recht sowie über fachunabhängige, über mehrere Disziplinen hinweg anwendbare Kompetenzen.

Durch die Verknüpfung ihrer Kenntnisse und Kompetenzen sind sie in der Lage, wirtschaftliche und informationstechnologische Gegebenheiten und Entwicklungspotentiale zur innovativen Veränderung von Strukturen und Prozesse selbstständig zu erkennen und innerhalb der rechtlichen Rahmenbedingungen umzusetzen.

Sie können komplexe fachrelevante Probleme und Anforderungen analysieren, strukturieren und beschreiben.

Vor- und Nachteile von bestehenden Verfahren, Modellen, Technologien und Ansätzen wissen sie zu identifizieren, mit Alternativen zu vergleichen, kritisch zu bewerten und auf neue Anwendungsbereiche zu transferieren.

Entsprechend des Bedarfs können sie diese auch kombinieren, anpassen bzw. eigenständig neue, innovative Lösungsmöglichkeiten entwickeln und umsetzen.

Die gewonnenen Ergebnisse wissen sie kritisch zu interpretieren, zu validieren und zu illustrieren.

Ihre Entscheidungen können sie wissenschaftlich fundiert unter Berücksichtigung von gesellschaftlichen und ethischen Aspekten selbstverantwortlich treffen und begründen.

Die Absolventen/innen können mit Fachvertretern/innen auf wissenschaftlichem Niveau kommunizieren und herausgehobene Verantwortung auch in einem Team übernehmen.

Karlsruher Informationswirte/innen zeichnen sich durch ihre interdisziplinäre Methodenkompetenz und ihre Innovationsfähigkeit aus.

Ihre Qualifikationen eignen sich insbesondere für fachübergreifende Tätigkeiten in den Bereichen Informations- und Kommunikationstechnologie (IKT), Controlling, Consulting, Management und Organisation, für die Gründung und Leitung von Unternehmen sowie für eine weitere wissenschaftliche Laufbahn (Promotion).

Studien- und Prüfungsordnung der Universität Karlsruhe (TH) für den Masterstudiengang 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 Masterstudiengang Informationswirtschaft beschlossen.

Der Rektor hat seine Zustimmung am 15. April 2009 erteilt.

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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 Studierendenausbildung an der Universität Karlsruhe (TH) der Mastergrad stehen soll. Die Universität Karlsruhe (TH) sieht daher die an der Universität Karlsruhe (TH) angebotenen konsekutiven Bachelor- und Masterstudiengänge als Gesamtkonzept mit konsekutivem Curriculum.

Aus Gründen der Lesbarkeit ist in dieser Satzung nur die männliche Sprachform gewählt worden. Alle personenbezogenen Aussagen gelten jedoch stets für Frauen und Männer gleichermaßen.

I. Allgemeine Bestimmungen

§ 1 Geltungsbereich, Zweck der Prüfung

(1) Diese Masterprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Masterstudiengang Informationswirtschaft an der Universität Karlsruhe (TH).

(2) Die Masterprüfung (§ 16 – 18) bildet den Abschluss dieses Studiengangs, der gemeinsam von der Fakultät für Informatik und der Fakultät für Wirtschaftswissenschaften an der Universität Karlsruhe (TH) angeboten wird. Durch die Masterprüfung soll festgestellt werden, ob der Studierende die für den Übergang in die Berufspraxis grundlegenden wissenschaftlichen Fachkenntnisse besitzt, die Zusammenhänge des Faches Informationswirtschaft überblickt und die Fähigkeit besitzt, nach wissenschaftlichen Methoden und Grundsätzen selbstständig zu arbeiten.

§ 2 Akademischer Grad

Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science“ (abgekürzt: „M.Sc.“) für den Studiengang Informationswirtschaft (englischsprachig: Information Engineering and Management) verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

(1) Die Regelstudienzeit beträgt vier Semester. Sie umfasst neben den Lehrveranstaltungen Prüfungen und die Masterarbeit.

(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 § 16 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 120 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 § 16 Abs. 2 Satz 2 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 Masterprüfung besteht aus einer Masterarbeit 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 ist die Prüfung nach § 16 Abs. 3.

§ 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 Masterarbeit.

(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 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.

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 § 14 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 Masterzeugnis 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 Masterarbeit, 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 jeweils nur einmal angerechnet werden. Die Anrechnung eines Moduls, einer Lehrveranstaltung oder einer Erfolgskontrolle ist darüber hinaus ausgeschlossen, wenn das betreffende Modul, die Lehrveranstaltung oder die Erfolgskontrolle bereits in einem grundständigen Bachelorstudiengang angerechnet wurde, auf dem dieser Masterstudiengang konsekutiv aufbaut.

(6) Erfolgskontrollen anderer Art dürfen in Modulprüfungen oder Modulteilprüfungen 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 Masterarbeit, 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 Masterprüfung, 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 Masterprüfung 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 Hauptdiplomsnoten des Diplomstudiengangs Informationswirtschaft per 31. Juli 2005 zur Bildung dieser Skala für alle Module des Masterstudiengangs Informationswirtschaft 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 Wiederholung von Prüfungen und Erfolgskontrollen, Erlöschen des Prüfungsanspruchs

(1) 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.

(2) Studierende können eine nicht bestandene mündliche Prüfung (§ 4 Abs. 2, Nr. 2) einmal wiederholen.

(3) Wiederholungsprüfungen nach Absatz 1 und 2 müssen in Inhalt, Umfang und Form (mündlich oder schriftlich) der ersten entsprechen. Ausnahmen kann der zuständige Prüfungsausschuss auf Antrag zulassen. Fehlversuche an anderen Hochschulen sind anzurechnen.

(4) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Abs. 2, Nr. 3) wird im Studienplan geregelt.

(5) 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 1 Satz 2 und 3 gelten entsprechend.

(6) Die Wiederholung einer bestandenen Erfolgskontrolle ist nicht zulässig.

(7) Eine Fachprüfung ist endgültig nicht bestanden, wenn mindestens ein Modul des Faches endgültig nicht bestanden ist.

(8) Die Masterarbeit kann bei einer Bewertung mit „nicht ausreichend“ einmal wiederholt werden. Eine zweite Wiederholung der Masterarbeit ist ausgeschlossen.

(9) Ist gemäß § 34 Abs. 2 Satz 3 LHG die Masterprüfung bis zum Ende des siebten 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 Voraussetzung 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 Abs. 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 Masterarbeit 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 Attestes 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.

(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.

(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) Absatz 1 - 6 gelten für Erfolgskontrollen anderer Art (§ 4 Abs. 2, Nr. 3) entsprechend.

(8) 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 Masterarbeit 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 Masterarbeit 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 Masterarbeit

(1) Vor Zulassung der Masterarbeit 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 Masterarbeit erhält. Die Ausgabe des Themas erfolgt in diesem Fall über den Vorsitzenden des Prüfungsausschusses.

(2) Thema, Aufgabenstellung und Umfang der Masterarbeit sind vom Betreuer so zu begrenzen, dass sie mit dem in Absatz 3 festgelegten Arbeitsaufwand bearbeitet werden kann.

(3) Die Masterarbeit soll zeigen, dass der Studierende in der Lage ist, ein Problem aus seinem Fach selbstständig und in der vorgegebenen Zeit nach wissenschaftlichen Methoden, die dem

Stand der Forschung entsprechen, zu bearbeiten. Der Masterarbeit werden 30 Leistungspunkte zugeordnet. Die Bearbeitungsdauer beträgt sechs Monate. Die Masterarbeit kann auch in englischer Sprache geschrieben werden.

(4) Die Masterarbeit kann von jedem Prüfer nach § 14 Abs. 2 vergeben werden. Soll die Masterarbeit 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 Masterarbeit 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 Masterarbeit hat der Studierende schriftlich zu versichern, dass er die Arbeit selbstständig verfasst hat und keine anderen als die von ihm 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 Masterarbeit mit „nicht ausreichend“ (5.0) bewertet.

(6) Der Zeitpunkt der Ausgabe des Themas der Masterarbeit und der Zeitpunkt der Abgabe der Masterarbeit sind beim Prüfungsausschuss aktenkundig zu machen. Der Studierende kann das Thema der Masterarbeit nur einmal und nur innerhalb der ersten zwei Monate der Bearbeitungszeit zurückgeben. Auf begründeten Antrag des Studierenden kann der Prüfungsausschuss die in Absatz 1 festgelegte Bearbeitungszeit um höchstens drei Monate verlängern. Wird die Masterarbeit 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 Masterarbeit wird von einem Betreuer sowie in der Regel von einem weiteren Prüfer aus der jeweils anderen Fakultät der beiden nach § 1 Abs. 2 Satz 1 beteiligten Fakultäten begutachtet und 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 Masterarbeit fest. Der Bewertungszeitraum soll acht Wochen nicht überschreiten.

§ 12 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, als für das Bestehen der Modul- bzw. Fachprüfung erforderlich sind. § 3, § 4 und § 8 Abs. 9 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 Masterzeugnis 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.

§ 13 Prüfungsausschuss

(1) Für den Masterstudiengang 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 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 Prüfungsordnung eingehalten werden. Er entscheidet über die Anrechnung von Studienzeiten, Studien- und Prüfungsleistungen 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.

§ 14 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 Masterarbeit 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.

§ 15 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 Masterprüfung kann versagt werden, wenn in einem Studiengang mehr als 45 Leistungspunkte und/oder die Masterarbeit 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.

(8) Zusatzleistungen, die ein Studierender für den Bachelorstudiengang Informationswirtschaft erbracht hat und die im Studienplan des Masterstudiengangs Informationswirtschaft vorgesehen sind, werden auf Antrag des Studierenden an den Prüfungsausschuss anerkannt.

II. Masterprüfung

§ 16 Umfang und Art der Masterprüfung

(1) Die Masterprüfung besteht aus den Fachprüfungen nach Absatz 2, dem interdisziplinären Seminarmodul nach Absatz 3 sowie der Masterarbeit nach § 11.

(2) In den ersten beiden Studienjahren sind Fachprüfungen aus folgenden Fächern durch den Nachweis von Leistungspunkten in einem oder mehreren Modulen abzulegen:

1. aus dem Fach Betriebswirtschaftslehre im Umfang von 10 Leistungspunkten,
2. aus dem Fach Operations Research im Umfang von 5 Leistungspunkten.

Des Weiteren sind Fachprüfungen

1. aus wirtschaftswissenschaftlichen Fächern durch Module im Umfang von 18 Leistungspunkten,
2. aus dem Fach Informatik durch Module im Umfang von 33 Leistungspunkten,
3. aus dem Fach Recht durch Module im Umfang von 18 Leistungspunkten

abzulegen. Wirtschaftswissenschaftliche Fächer sind Betriebswirtschaftslehre, Operations Research, Statistik und Volkswirtschaftslehre. Dabei sind im Fach Betriebswirtschaftslehre mindestens 9 Leistungspunkte abzulegen. 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) Ferner muss ein interdisziplinäres Seminarmodul im Umfang von 6 Leistungspunkten absolviert werden, das von je einem Prüfer nach § 14 Abs. 2 aus der Informatik, dem Recht und den Wirtschaftswissenschaften betreut wird.

(4) Als eine weitere Prüfungsleistung ist eine Masterarbeit gemäß § 11 anzufertigen.

§ 17 Bestehen der Masterprüfung, Bildung der Gesamtnote

(1) Die Masterprüfung ist bestanden, wenn alle in § 16 genannten Prüfungsleistungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Masterprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt. Dabei werden alle Prüfungsleistungen nach § 16 mit ihren Leistungspunkten gewichtet.

(3) Hat der Studierende die Masterarbeit mit der Note 1.0 und die Masterprüfung mit einer Gesamtnote von 1.0 abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen. Mit einer Masterarbeit mit der Note 1.0 und bis zu einer Gesamtnote von 1.3 kann auf Antrag an den Prüfungsausschuss das Prädikat „mit Auszeichnung“ (with distinction) verliehen werden.

§ 18 Masterzeugnis, Masterurkunde, Transcript of Records und Diploma Supplement

(1) Über die Masterprüfung werden nach Bewertung der letzten Prüfungsleistung eine Masterurkunde und ein Zeugnis erstellt. Die Ausfertigung von Masterurkunde und Zeugnis soll nicht später als sechs Wochen nach der Bewertung der letzten Prüfungsleistung erfolgen. Masterurkunde und Zeugnis werden in deutscher und englischer Sprache ausgestellt. Masterurkunde und Zeugnis tragen das Datum der letzten erfolgreich nachgewiesenen Prüfungsleistung. Sie werden dem Studierenden gleichzeitig ausgehändigt. In der Masterurkunde wird die Verleihung des akademischen Mastergrades beurkundet. Die Masterurkunde 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, im interdisziplinären Seminarmodul und der Masterarbeit 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 Masterurkunde, das Masterzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studienbüro der Universität ausgestellt.

III. Schlussbestimmungen

§ 19 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen

(1) Der Bescheid über die endgültig nicht bestandene Masterprüfung wird dem Studierenden durch den Prüfungsausschuss in schriftlicher Form erteilt. Der Bescheid ist mit einer Rechtsbehelfsbelehrung zu versehen.

(2) Hat der Studierende die Masterprüfung 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.

§ 20 Ungültigkeit der Masterprüfung, Aberkennung des Mastergrades

(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 Kandidat die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung 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 sind auch die Masterurkunde, das Masterzeugnis 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 Mastergrades richtet sich nach den gesetzlichen Bestimmungen.

§ 21 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Masterprüfung wird dem Studierenden auf Antrag innerhalb eines Jahres Einsicht in seine Masterarbeit, 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.

§ 22 In-Kraft-Treten

(1) Diese Satzung tritt am 1. Oktober 2009 in Kraft.

(2) Studierende, die auf Grundlage der Prüfungsordnung für den Masterstudiengang Informationswirtschaft vom 30. April 2006 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 9 vom 07. Oktober 2006) ihr Studium an der Universität Karlsruhe (TH) aufgenommen haben, können einen Antrag auf Zulassung zur Prüfung letztmalig am 30. März 2013 stellen.

(3) Auf Antrag können Studierende, die ihr Studium an der Universität Karlsruhe (TH) auf Grundlage der Prüfungsordnung für den Masterstudiengang Informationswirtschaft vom 30. April 2006 (Amtliche Bekanntmachung der Universität Karlsruhe (TH) Nr. 9 vom 07. Oktober 2006) 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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