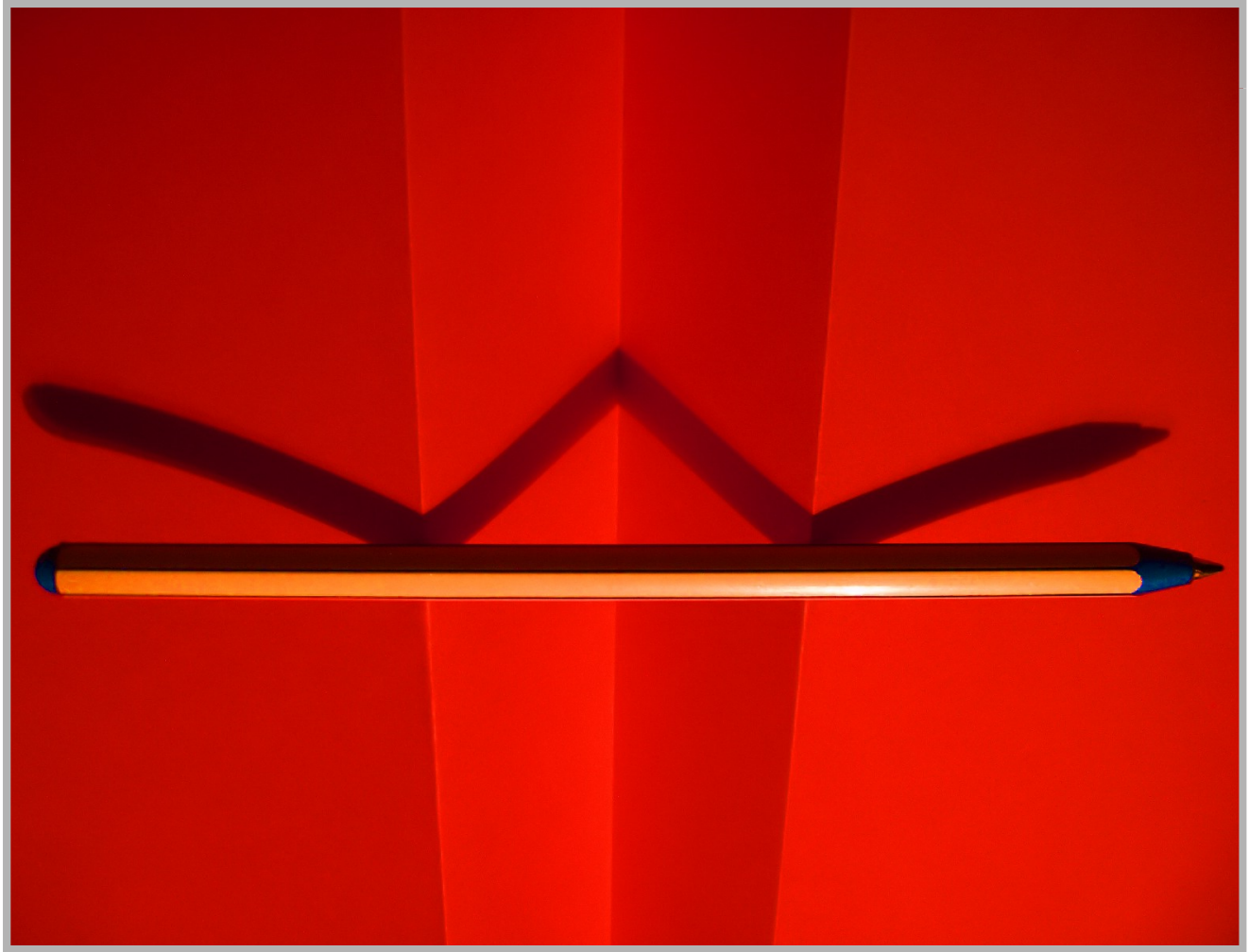
Karlsruhe Institute of Technology

Module Handbook Information Engineering and Management (M.Sc.) ER 2006

Summer term 2010
Short version
04.03.2010

Faculty of Economics and Business Engineering
Fakultät für Informatik



KIT - University of the State of Baden-Wuerttemberg and
National Research Center of the Helmholtz Association

www.kit.edu

Publishers:

Fakultät für Wirtschaftswissenschaften

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Photographer of cover picture: Arno Peil

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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 (7 - 9 when counting consecutively) 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, operations research, and law should be studied in the first two terms of the programme.
- The interdisciplinary seminar should be taken in 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 (the 10-th term when counted consecutively) is reserved for the Master's 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.

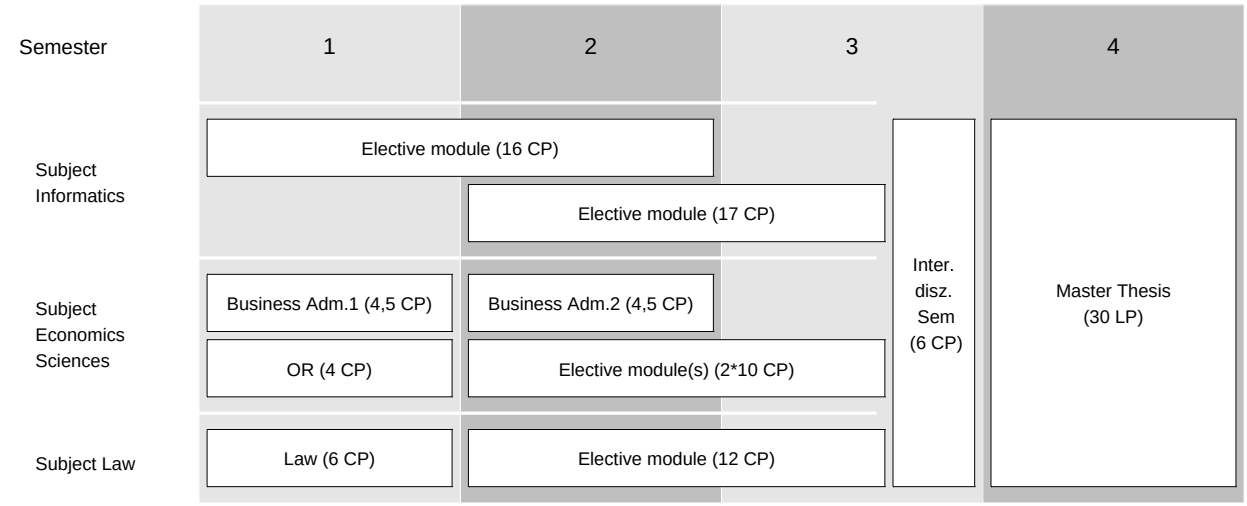

Abbildung 1: Structure of the Master Programme in Information Engineering and Management (Recommendation)

Mandatory Modules (25 CP)

The mandatory part of the programme consists of the following modules:

ModuleID	Module	Subject	Coordinator	CP
IW4WWIW1	Information Engineering and Management 1	Business Administration	Weinhardt	4.5
IW4WWIW2	Information Engineering and Management 2	Business Administration	Geyer-Schulz	4.5
IW4WWOR	Stochastic Models in Information Engineering and Management	Operations Research	Waldmann	4
IW4INJURA	Law	Law	Dreier	6
IW4IWSEM	Interdisziplinary Seminar		Dreier	6
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Tabelle 1: Mandatory Modules

Elective Modules: Business Administration/OR/Economics/Statistics

The elective programme in the economic sciences consists either of one module with 20 CP or 2 modules with 10 CP each.

Elective Modules: Informatics

The student has to choose one module with 16 CP and one module with 17 CP.

Elective Modules: Law

The student has to choose law module(s)) with 12 CP.

2 Module Handbook - a helpful guide throughout the studies

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

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

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

Begin and completion of a module

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

General exams and partial exams

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

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

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

Repeating exams

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

Bonus accomplishments and additional accomplishments

Bonus accomplishments can be achieved on the basis of entire modules or within modules, if there are alternatives at choice. Bonus accomplishments can improve the module grade and overall grade by taking into account only the best possible combination of all courses when calculating the grades. The student has to declare a Bonus accomplishment as such at the time of registration for the exams. Exams, which have been registered as Bonus accomplishments, are subject to examination regulations. Therefore, a failed exam has to be repeated. Failing the repeat examination implies the loss of the examination claim.
Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student

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

Further information

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

Used abbreviations

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

3 Actual Changes

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

Advanced Algorithms [IW4INAALG] (S. 17)

Anmerkungen

Currently, the course *Graph Algorithms* is not lectured.
The lecuter Algorithm Design is not offered anymore. The exam is possible for students who failed, only.

e-Collaboration [IW4INECOLL] (S. 18)

Anmerkungen

Information, Market, and Service Engineering [IW4WWIMSE] (S. 29)

Anmerkungen

The course *Electronic Markets: Institutions and Market Mechanisms* will not be offered any more. An exam will be offered in september 2010.

Information and Market Engineering [IW4WWIMSE1] (S. 31)

Anmerkungen

The course *Electronic Markets: Institutions and Market Mechanisms* will not be offered any more. An exam will be offered in september 2010.

4 Mandatory Modules

4.1 All Subjects

Module: Information Engineering and Management 1 Module key: [IW4WWIW1]

Subject: Business Administration (obligatory)
Module coordination: Christof Weinhardt
Credit points (CP): 4.5

Learning Control / Examinations
The overall grade is determined by the result of the course “Principles of Information Engineering and Management”.

Prerequisites
None.

Conditions
The course “Principles of Information Engineering and Management” must be chosen.

Learning Outcomes
The compulsory module “Information Engineering and Management 1” introduces students to basic knowledge and skills in the field of Information Engineering and Management. The students should be able to understand and analyze the central role of information as an economic good, a production factor, and a competitive factor in today´s societies. Students are supposed to be able to identify, evaluate, price, and market information goods with the help of the concepts and methods taught in the lecture. Furthermore, students learn basic aspects about information systems and information flows within and between organizations, as well as their design parameters.

Content
The module “Information Engineering and Management 1” comprises the lecture “Principles of Information Engineering and Management”. There, 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 existence/generation through allocation and evaluation until the distribution 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.

Courses in module *Information Engineering and Management 1* [IW4WWIW1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26450	Principles of Information Engineering and Management	2/1	W	4,5	C. Weinhardt, J. Kraemer, C. van Dinther

Remarks
None.

Module: Information Engineering and Management 2 Module key: [IW4WWIW2]

Subject: Business Administration (obligatory)
Module coordination: Andreas Geyer-Schulz
Credit points (CP): 4.5

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

Prerequisites
Basic knowledge from Operations Research (linear programming) and from decision theory are expected.

Conditions
None.

Learning Outcomes
The student is able to

- transfer models from Business Administration to situations in business whose basic conditions are changed due to the implementation of information and communication technology,
- apply methods from Business Administration (Decision theory, game theory, operations research, etc.) to questions of Information Engineering and Management,
- analyze the potential to automize the decision making process in businesses by data bases,
- describe the process to extract relevant data for decision making from operational accounting systems.

Content
In the module *Information Engineering and Management 2*, classical Business Administration is applied to businesses in an information- and communicationtechnological 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 automization 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 adressed by presenting models and methods from system dynamics.

Courses in module *Information Engineering and Management 2* [IW4WWIW2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26500	Business Administration in Information Engineering and Management	2/1	S	4,5	A. Geyer-Schulz

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

Subject: Operations Research (obligatory)
Module coordination: Karl-Heinz Waldmann
Credit points (CP): 4

Learning Control / Examinations
The assessment of the module is in a written examination according to §4(2), 1 of the examination regulation of the Bachelor programme in Information Engineering and Management. 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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The students are familiar with the modern concepts of stochastic modeling and are in a position to describe and to analyse simple systems in an adequate way.

Content

Courses in module *Stochastic Models in Information Engineering and Management* [IW4WWOR]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25679	Markov Decision Models I	2/1/2	W	4	K. Waldmann

Module: Contract Drafting and Internet Law — Module key: [IW4INJURA]

Subject: Law (obligatory)
Module coordination: Thomas Dreier
Credit points (CP): 6

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

1. a written examination (§ 4(2), 1 of the SPO) for the course “Law of Contracts” (see also the transition rule until the winter semester 2008/9)
2. a written examination (§ 4(2), 1 of the SPO) for the course “Internet Law” (see also the transition rule until the winter semester 2008/9)

The grade of the module is a credits weighted average of the grades.

Prerequisites
The oblgatory module law builds upon the legal lectures of the bachelor study course. The courses can be followed parallel to the courses of the elective moduls.

Conditions
The courses of the oblgatory module law whall introduce the students to the most important areas of information law.

Learning Outcomes
The Students should be enabled to analyse and draft contracts, and to get acquainted with current legal issues that are raised by the use of the internet.

Content
The obligatory module law depends the understanding of students of the legal issues of the information society.

Courses in module *Contract Drafting and Internet Law* [IW4INJURA]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24671	Law of Contracts	2/0	S	3	P. Sester
24812	Internet Law	2/0	S	3	T. Dreier

Remarks
Please note the following:
- During the transition period until the winter semester 2008/09 students can also replace the course “Law of Contracts” by the course “Computer contract law” (2 SWS, Semester: SS, 3 CP, lecturer Bartsch, Michael).

Module: Interdisciplinary Seminar — Module key: [IW4IWSEM]

Module coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften)
Credit points (CP): 6

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 interdisciplinary seminar separately.

Prerequisites
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.
The interdisciplinary seminar should be taken as last course of the compulsory program in the 3rd term of the Master programme.

Conditions
Regulated in §14 of the examination regulation for the Master programme Information Engineering and Management.

Learning Outcomes

- 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 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.

Courses in module *Interdisciplinary Seminar* [IW4IWSEM]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26530	Interdisciplinary Seminar in Information Engineering and Management	2	W/S	6	A. Geyer-Schulz, T. Dreier

Module: Master Thesis — Module key: [IW4IWMATHESIS]

Module coordination: Martina Zitterbart, Studiendekan (Fak. f. Wirtschaftswissenschaften), Vorsitzender des Prüfungsausschusses
Credit points (CP): 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.

Prerequisites
None.

Conditions
Regulated in §15 of the examination regulation.
The requirements for the examiner are described in §6 (2) of the examination regulation.

Learning Outcomes
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 (Faculty of Informatics, Faculty of Economics and Business Engineering) 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 (Faculty of Informatics, Faculty of Economics and Business Engineering). 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 Informatics

Module: Advanced Algorithms — Module key: [IW4INAALG]

Subject: Informatics
Module coordination: Dorothea Wagner
Credit points (CP): 16 oder 17

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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The Student should be able to evaluate the computational complexity of problems from different fields and apply appropriate solution algorithms. Besides algorithm design and theoretical analysis of algorithms with respect to running time and space consumption also issues like parallelism, different models of computation, implementation and experimental evaluation should be taken into account.

Content
In this module, modern and efficient algorithms and their design and analysis are presented in the context of various applications such as visualization, networks, parallel algorithms, distributed algorithms, sensor- and ad-hoc networks, nature-oriented techniques, quantum computing, coding and computer algebra.

Courses in module *Advanced Algorithms* [IW4INAALG]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24171	Randomized Algorithms	2	W	4	T. Worsch
xAlgoEng	Algorithm Engineering	2	W/S	4	P. Sanders, D. Wagner
AlgVG	Algorithms for Visualization of Graphs	2/1	S	5	D. Wagner, M. Nöllenburg
xGraphAlgo	Graph Algorithms	2	W/S	4	D. Wagner
24109	Parallel Algorithms	2	W/S	4	P. Sanders
25708	Distributed Algorithms	3	W/S	5	H. Schmeck
25706	Nature-inspired Optimisation	2/1	W	5	S. Mostaghim, P. Shukla
24622	Algorithms in Cellular Automata	2/1	S	5	T. Worsch
24079p	Practical Course in Algorithm Design	4	W/S	5	P. Sanders, D. Wagner, M. Krug
24614	Algorithms for Planar Graphs	2/1	S	5	D. Wagner
AlgAS	Algorithms for Ad-Hoc and Sensor Networks	2	S	4	B. Katz

Remarks
Currently, the course *Graph Algorithms* is not lectured.
The lecuter Algorithm Design is not offered anymore. The exam is possible for students who failed, only.

Module: e-Collaboration — Module key: [IW4INECOLL]

Subject: Informatics
Module coordination: Andreas Oberweis
Credit points (CP): 16 oder 17

Learning Control / Examinations
Students select courses with 16 or 17 ECTS credits in total.
The assessment mix of each course of this module is defined for each course separately. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
None.

Conditions
- A maximum of one seminar can be chosen.
- A maximum of one practical course can be chosen.

Learning Outcomes
Students can use languages and methods for planning and design of eCollaboration. They are able to evaluate, select and to use appropriate tools taking into account the current situation.

Content
e-Collaboration covers all forms of cooperation and coordination in electronic networks, and is practiced in many forms. The ubiquitous availability of new information and communication technologies in increasingly becoming smaller and more powerful devices enables new forms of eCollaboration. These will not only change the business world and public administration, but will also change fundamentally the private lives of people. This module teaches methodological foundations of applied computer science for eCollaboration applications covering languages for modelling of structured and unstructured processes of eCollaboration and methods for the design and analysis of eCollaboration scenarios. In addition, this module imparts knowledge of software systems to support eCollaboration (e.g., groupware systems, workflow management systems, document management systems).

Courses in module *e-Collaboration* [IW4INECOLL]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25724	Database Systems and XML	2/1	W	5	A. Oberweis
25735	Document Management and Groupware Systems	2	S	4	S. Klink
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25750	Semantic Web Technologies II	2/1	S	5	S. Agarwal, S. Grimm, E. Simperl, A. Harth
25722	Distributed Database Systems: Basic Technology for e-Business	2/1	S	5	A. Oberweis
24654	Component Based Software Engineering	2	S	3	R. Reussner, M. Kuperberg, K. Krogmann
25760	Complexity Management	2/1	S	5	D. Seese
25788	Strategic Management of Information Technology	2/1	S	5	T. Wolf
25784	Management of IT-Projects	2/1	S	4	R. Schätzle
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
25070s	Seminar in Applied Informatics	2	W/S	4	A. Oberweis, H. Schmeck, D. Seese, W. Stucky, R. Studer, S. Tai
25070p	Advanced Lab Applied Informatics	2	W/S	5	A. Oberweis, H. Schmeck, D. Seese, W. Stucky, R. Studer, S. Tai
25764	IT Complexity in Practice	2/1	W	5	Kreidler

Remarks

Module: Complex Internet Applications — Module key: [IW4INIAPP]

Subject: Informatics
Module coordination: Hartmut Schmeck
Credit points (CP): 16

Learning Control / Examinations
The control of success is discribed in the lectures of this module.
The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
None.

Conditions
Selected courses have to add up to at least 16 or 17 credit points.
Besides the listed courses you may choose a seminar or advanced lab on the topics of this module offered by one the participating lecturers.

Learning Outcomes
The Student should become acquainted with challinging internet technology applications, and should be able to apply useful tools and techniques to design an internet application, according to the requirement of a concrete section of application.

Content
The lectures of this module, procure diverse knowlege about current techniques to configurate challinging applications in the internet and world wide web.

Courses in module *Complex Internet Applications* [IW4INIAPP]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24153/24604	Advanced Web Applications	2/0	W/S	4	S. Abeck
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
24146	Ubiquitous Computing	2/0	W	4	W. Juling
25748	Semantic Web Technologies I	2/1	W	5	R. Studer, S. Rudolph
25750	Semantic Web Technologies II	2/1	S	5	S. Agarwal, S. Grimm, E. Simperl, A. Harth
24304/24873	Practical Course Web Technologies	2/0	W/S	4	S. Abeck, Gebhart, Hoyer, Link, Pansa
25704	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
24124	Web Engineering	2/0	W	4	M. Nußbaumer
24149	Network and IT-Security Management	2/1	W	5	H. Hartenstein

Remarks
The list of lectures is temporarily.

Module: Large-Scale Information and Knowledge Management Module key: [IW4INLIKM]

Subject: Informatics
Module coordination: Klemens Böhm
Credit points (CP): 16 oder 17

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

Prerequisites
This module presupposes knowledge on database systems and knowledge management, such as the content of lectures “Communications and Database Systems” and “Knowledge Management”. The courses in this module assume the following basic knowledge: data models, database design, relational algebra, database-application development and declarative query languages, transactions, ontology-based knowledge management, information retrieval, intelligent document management, communities of practice, skill management, personal knowledge management and case-based reasoning (CBR).
The students are strongly advised to select this module only if they are familiar with the topics mentioned. Alternatively, it is advised to select the module “Advanced Concepts of Information and Knowledge Management” which does not presuppose this knowledge.

Conditions
- This module cannot be chosen in combination with module “Advanced Concepts of Information and Knowledge Management”.
- At least one of the following lectures have to be selected: “Deployment of Database Systems”, “Data Warehousing and Mining”, “Database Implementation and Tuning”.
- No course can be chosen which has been absolved in the undergraduate studies
- Maximally one seminar can be chosen.
- Maximally one practical course can be chosen.
- You may not choose both “Data Warehousing and Mining” and “Knowledge Discovery”, only one of the two. Further, it is not possible to choose one of these lectures if you have chosen the other one within another module.

Learning Outcomes
The students should
- be able to work scientifically in the field of information and knowledge management and know the different aspects of this field,
- be able to develop complex database applications on their own,
- be able to manage and lead projects of unpredictable complexity in the field of information and knowledge management
- be able to explain and discuss non-trivial aspects of the topics covered in this module with other experts and people without a deep knowledge of information and knowledge management.

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

Courses in module *Large-Scale Information and Knowledge Management* [IW4INLIKM]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
dbe	Deployment of Database Systems	2/1	W	5	K. Böhm
24118	Data Warehousing and Mining	2/1	W	5	K. Böhm
24114	Distributed Data Management	2/1	W	5	K. Böhm
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
24111	Workflowmanagement-Systems	2	W	3	J. Mülle
24141	Information Integration and Web Portals	2	W	3	J. Mülle
25742	Knowledge Discovery	2/1	W	5	R. Studer
semis	Seminar Information Systems	2	W/S	4	K. Böhm
25810	Practical Seminar Knowledge Discovery	2	S	4	R. Studer
dbprakt	Practical Course Database Systems	2	W	4	K. Böhm
24874	Practical Course Data Warehousing and Mining	2	S	4	K. Böhm
praktvd	Practical Course Distributed Data Management	2	W	4	K. Böhm
24605	Data Privacy Protection in Interconnected Information Systems	2	S	3	Buchmann
MOD	Moving Objects Databases	2	W	3	K. Böhm

Module: Advanced Concepts of Information and Knowledge Management Module key: [IW4INLIKM1]

Subject: Informatics
Module coordination: Klemens Böhm
Credit points (CP): 16 oder 17

Learning Control / Examinations
The assessment is described individually for each lecture within this module. The overall grade of the module will be the rounded average of the courses selected weighted by their respective credits.
The assessment of the course *Database Systems* follows Sec. 4 Subsec. 2 No. 3 of the study and examination regulations.

Prerequisites
None.

Conditions

- This module cannot be chosen in combination with module *Large-Scale Information and Knowledge Management*.
- The lectures *Database Systems* and *Knowledge Management* have to be selected if they have not yet been selected and assessed.
- Maximally one seminar can be chosen.
- Maximally one practical course can be chosen.
- You may not choose both *Data Warehousing and Mining* and *Knowledge Discovery,* only one of the two. Further, it is not possible to choose one of these lectures if you have chosen the other one within another module.

Learning Outcomes
The students should

- be able to work scientifically in the field of information and knowledge management and know the different aspects of this field,
- be able to develop complex database applications on their own,
- be able to manage and lead projects of unpredictable complexity in the field of information and knowledge management,
- be able to explain and discuss non-trivial aspects of the topics covered in this module with other experts and people without a deep knowledge of information and knowledge management.

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

Courses in module *Advanced Concepts of Information and Knowledge Management* [IW4INLIKM1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25740	Knowledge Management	2/1	W	5	R. Studer
24118	Data Warehousing and Mining	2/1	W	5	K. Böhm
24114	Distributed Data Management	2/1	W	5	K. Böhm
db_impl	Database Implementation and Tuning	2/1	S	5	K. Böhm
24111	Workflowmanagement-Systems	2	W	3	J. Mülle
25742	Knowledge Discovery	2/1	W	5	R. Studer
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
semis	Seminar Information Systems	2	W/S	4	K. Böhm
25810	Practical Seminar Knowledge Discovery	2	S	4	R. Studer
24874	Practical Course Data Warehousing and Mining	2	S	4	K. Böhm
24605	Data Privacy Protection in Interconnected Information Systems	2	S	3	Buchmann
24516	Database Systems	2/1	S	4	K. Böhm

Module: Advanced Infrastructures — Module key: [IW4INNET]

Subject: Informatics
Module coordination: Martina Zitterbart
Credit points (CP): 16 oder 17

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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The student will

- study design principles of communication systems, apply them in a new context, and be able to identify flaws of existing systems
- be able to evaluate the performance potential of protocols, networks, and architectures
- master advanced protocols, architectures, and algorithms of communication networks and systems

Content
Within this module, different aspects of communication systems are examined in more detail. Besides requirements and solutions for multimedia, mobile and secure communication, knowledge about the deployment and management of large communication networks and systems are offered to the student. An important subject hereby is the evaluation and mastery of the applied architectures, protocols, and algorithms. In addition, the lectures offer room for current and future developments in the area of Telematics.

Courses in module *Advanced Infrastructures* [IW4INNET]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24074	Networked IT-Infrastructures	2/1	W	5	W. Juling
24128	Telematics	2	W	4	M. Zitterbart
24132	Multimedia Communications	2/0	W	4	R. Bless
24674	Next Generation Internet	2/0	S	4	R. Bless
24643	Mobile Communications	2/0	S	4	O. Waldhorst
24601	Network Security: Architectures and Protocols	2/0	S	4	M. Schöller
24149	Network and IT-Security Management	2/1	W	5	H. Hartenstein
24110	High Performance Communication	2/0	W	4	M. Zitterbart
24669	Simulation of Computer Networks	2/0	S	4	H. Hartenstein
24146	Ubiquitous Computing	2/0	W	4	W. Juling
24104	Wireless Sensor-Actuator-Networks	2/0	W	4	M. Zitterbart
24074s	Seminar in Telematics	2	W/S	4	M. Zitterbart, H. Hartenstein
PrakATM	Lab Advanced Telematics	2	W/S	5	M. Zitterbart
24519	Introduction in Computer Networks	2/1	S	4	H. Hartenstein

Module: Software Systems — Module key: [IW4INSW]

Subject: Informatics
Module coordination: Walter F. Tichy, Ralf Reussner
Credit points (CP): 16 oder 17

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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The student will be enabled to systematically plan, build and maintain large software systems. To this end, suitable methods and tools will be presented.

Content
Subject of the module is the planing, development, and maintenance of large software systems.

Courses in module *Software Systems* [IW4INSW]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24075	Software Architecture	2	W	4	R. Reussner
24654	Component Based Software Engineering	2	S	3	R. Reussner, M. Kuperberg, K. Krogmann
24112	Multicore Computers and Computer Clusters	2	W	4	W. Tichy, Pankratius, Victor
24660	Software Development for modern, parallel platforms	2	S	3	W. Tichy, Pankratius, Otto
24625	Model Driven Software Development	2	S	4	R. Reussner, S. Becker
SWT2	Software Engineering II	3/1	W	6	R. Reussner, W. Tichy

Remarks
The lecture *Softwaretechnik* will not be offered after the summer term 09. The exam of the lecture will be offered in the summer term 2010 for the last time.

Module: Service Technologies — Module key: [IW4INSER]

Subject: Informatics
Module coordination: Stefan Tai
Credit points (CP): 17

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

Prerequisites
None.

Conditions
The course *Service-oriented Computing 1* [25770] has to be attended.
It is recommended to combine the module *Service Technologies* with the modules *Service Engineering* and *Service Management.*

Learning Outcomes
The module introduces methods and technologies for implementing service-oriented architectures. Students will be able to structure, design, and engineer modern, Web-based service-oriented systems for enterprises and for business networks. Students will acquire knowledge about current standards and tools.

Content
The module Service Technologies covers knowledge about designing and implementing service-oriented architectures. In this context several different aspects are considered:

- The modules introduces basic concepts of a service-oriented architecture and discusses differences to traditional software development.
- The module introduces technologies for implementing service-oriented architectures, including technical standards in the area of Web Services. In addition, an overview of existing development methodologies and tools is given.
- The module introduces technologies for improving collaboration between service requesters and providers, and it gives use cases for applying these technologies.
- Concepts and technologies for the distributed realization of highly scalable Web Services are presented.

Courses in module *Service Technologies* [IW4INSER]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
25772	Service Oriented Computing 2	2/1	S	5	S. Tai, R. Studer
25776	Cloud Computing	2/1	W	5	S. Tai, Kunze
25774	Web Service Engineering	2/1	S	5	C. Zirpins
26470	Seminar Service Science, Management & Engineering	2	W/S	4	S. Tai, C. Weinhardt, G. Satzger, R. Studer
25820	Lab Class Web Services	2	W	4	S. Tai, R. Studer, G. Satzger, C. Zirpins

5.2 Law

Module: Law of the Information Economy — Module key: [IW4INJUINWI]

Subject: Law
Module coordination: Thomas Dreier
Credit points (CP): 12

Learning Control / Examinations
The module exam consists of 4 written exams of 45 minutes each (§ 4 (2) 1 SPO. Each of the 4 exams covers one of the four courses which the student has selected within this module.
The overall grade of the module is calculated on the basis of the 4 grades, each of them weighed according to their respective CPs.

Prerequisites
None.

Conditions
The students can freely choose four of the courses assigned to this module each comprising 3 CP.

Learning Outcomes
The student

- solves complex legal problems that appear in the information society.

Content
By chosing the module *Law of the Information Economy*, the Student should gain a broad overview. Contrary to the other two modules *Law of Information Companies* and *Law of the Information Society*, which both aim at greater profiling and depening of particular aspects, the module *Law of the Information Economy* aims at an all englobing overview. Students choosing this module shall be able to solve complex legal problems that appear in the information society.

Courses in module *Law of the Information Economy* [IW4INJUINWI]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
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
24650	Civil Law for Advanced	2/0	S	3	P. Sester
24583	Computer Contract Law	2/0	S	3	M. Bartsch
24121	Copyright	2/0	W	3	T. Dreier
24661	Patent Law	2/0	S	3	N.N.
24136/24609	Trademark and Unfair Competition Law	2/0	W/S	3	Y. Matz, P. Sester
24082	Public Media Law	2	W	3	C. Kirchberg
24632	Telecommunications Law	2/0	S	3	I. Spiecker genannt Döhmann
24666	European and International Law	2/0	S	3	I. Spiecker genannt Döhmann
24815	Grundlagen des Patentrechts	2/0	W/S	3	K. Melullis

Remarks
None.

Module: Law of the Information Society — Module key: [IW4INJURDIG]

Subject: Law
Module coordination: Thomas Dreier
Credit points (CP): 12

Learning Control / Examinations
The module exam consists of 4 written exams of 45 minutes each (§ 4 (2) 1 of the SPO). Each of the 4 exams covers one of the four courses which the student has selected within this module. The overall grade of the module is calculated on the basis of the 4 grades, each of them weighed according to their respective CPs.

Prerequisites
None.

Conditions
The modul *Law of the Information Society* builds on the mandatory lectures *Contracting* and *Internet Law*. Students can choose 4 courses (3 CP) that form part of the module.

Learning Outcomes
By chosing the module *Law of the Information Society*, the Student should gain a broad overview of the Law of the Information Society. Contrary to the module *Law of Information Economies* students can gain a profile and specialization on aspects which focus on the information society as a whole rather than on individual enterprises. Rather, the focus is on general issues and trends which are raised by the development of the informatin society as a whole and which can be discussed even before they become of practical importance for individual market participants. Students choosing this module shall be able to recognisze new trends and discuss their legal implications.

Content
The module comprises courses which which cover general legal aspects of the information economy and the information society. The focus is less on issues which affect individual businesses, but rather on general issues affecting the mechanisms and development of the information society as such. Here, the legal framework is determined by national, but also by European law. The complexity of legal questions raised in this respect therefore results less out of a close-up, detailed perspective, but rather from the broad effects which these issues and trends have with regard to the future of the information society as such.

Courses in module *Law of the Information Society* [IW4INJURDIG]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24121	Copyright	2/0	W	3	T. Dreier
24661	Patent Law	2/0	S	3	N.N.
24136/24609	Trademark and Unfair Competition Law	2/0	W/S	3	Y. Matz, P. Sester
24082	Public Media Law	2	W	3	C. Kirchberg
24632	Telecommunications Law	2/0	S	3	I. Spiecker genannt Döhmann
24666	European and International Law	2/0	S	3	I. Spiecker genannt Döhmann
24815	Grundlagen des Patentrechts	2/0	W/S	3	K. Melullis

Remarks
None.

Module: Law for Information Companies — Module key: [IW4INJURDIU]

Subject: Law
Module coordination: Peter Sester
Credit points (CP): 12

Learning Control / Examinations
The module exam consists of 4 written exams of 45 minutes each according to § 4 (2) 1 SPO. Each of the 4 exams covers one of the four courses which the student has selected within this module.
The overall grade of the module is calculated on the basis of the 4 grades, each of them weighed according to their respective CPs.

Prerequisites
None.

Conditions
The module *Law for Information Companies* follows up on the compulsory courses *Form of Contract* and *Internet Law* and the courses which address the general legal basis of Corporate Law as well as the sector-specific problems of information enterprises. The students can freely choose four of the courses assigned to this module each comprising 3 CP.

Learning Outcomes
To begin with, the student should gain a general overview of the Corporate Law, as a great amount of legal problems related to the information enterprises are not sector-specific. Furthermore, the specific questions will be dealt with which follow from the character of the product information and transport as well as allocation of information. The student should be enabled to understand more complex legal and economic coherences in the area of the Law of information enterprises.

Content
The courses about the Law of information enterprises firstly cover the topic of Corporate Law in general, as a great part of the legal problems which arise in relation to information enterprises correspond with the general Corporate Law, which is mostly not sector-specific. Furthermore, the specific questions will be dealt with, which follow from the character of the product information and transport as well as allocation of information. The aim of the lectures on information enterprises is to give a basic understanding of the regulatory surrounding and the business structure within which the future alumni of the study course information enterprises will range in their everyday business life.

Courses in module *Law for Information Companies* [IW4INJURDIU]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
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
24650	Civil Law for Advanced	2/0	S	3	P. Sester
24583	Computer Contract Law	2/0	S	3	M. Bartsch

Remarks
None.

5.3 Economic Sciences

Module: Information, Market, and Service Engineering Module key: [IW4WWIMSE]

Subject: Economic Scienes
Module coordination: Andreas Geyer-Schulz, Christof Weinhardt
Credit points (CP): 20

Learning Control / Examinations
The assessment is described for every course in this module. The overall score of the module is composed of the single scores of the courses weighted with their credits.

Prerequisites
None.

Conditions

- The course *Market Engineering* [26460] has to be attended.
- No more than two of the courses *Management of Business Networks* [26452], *eFinance: Information Engineering and Management for Securities Trading* [26454] and *Customer Relationship Management* [26508] can be selected.
- The course [26510p] could only be selected additionally to the course [26510].
- The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [SemIW] and itcan only be chosen in conjunction with the course [26474].

Learning Outcomes
The student should learn to

- understand and analyze the role of information with its distinct facets (as digital information good, as competitive factor,...) and their impacts on entrepreneurial behaviour and economic developments
- develop and implement new products, services and markets in consideration of the technological progresses of information and communication technology and the increasing economic networking
- restructure and develop new business processes under those conditions
- design and construct innovative business models and new forms of organisation in companies and company networks
- understand and analyze the emergence of new forms of competition

Content
The module Information, Market, and Service Engineering treats different aspects of information (digitial economic good, competitive factor, ...) and puts them into a business and economic context. Furthermore, this module addresses the challenges of creating new kinds of products, services, markets, and market information services in the context of new developed information and communication technologies. These developments offer the opportunity to develop new and innovative business processes, business models, forms of organization, markets, and competition. These issues are addressed in the courses of this module.

Courses in module *Information, Market, and Service Engineering* [IW4WWIMSE]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26460	Market Engineering: Information in Institutions	2/1	S	5	C. Weinhardt, J. Kraemer, C. van Dinther
26452	Management of Business Networks	2/1	W	5	C. Weinhardt, J. Kraemer
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	5	C. Weinhardt, R. Riordan
26456	Business Models in the Internet: Planning and Implementation	2/1	S	5	C. Weinhardt, C. Holtmann, C. van Dinther
26502	Electronic Markets (Principles)	2/1	W	5	A. Geyer-Schulz
26504	Electronic Markets: Institutions and Market Mechanisms	2/1	S	5	A. Geyer-Schulz
26508	Customer Relationship Management	2/1	W	5	A. Geyer-Schulz
26506	Personalization and Recommender Systems	2/1	S	5	A. Geyer-Schulz
26518	Social Network Analysis in CRM	2/1	W/S	5	B. Hoser
26510	Master Seminar in Information Engineering and Management	2	W	3	A. Geyer-Schulz
26510p	Practical Course in Information Engineering and Management (Master)	0*	W	2	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	4	C. Weinhardt
26477	Practical seminar Information Engineering and Management	0*	W/S	1	C. Weinhardt

Remarks
The course *Electronic Markets: Institutions and Market Mechanisms* will not be offered any more. An exam will be offered in september 2010.

Module: Information and Market Engineering — Module key: [IW4WWIMSE1]

Subject: Economic Scienes
Module coordination: Christof Weinhardt, Andreas Geyer-Schulz
Credit points (CP): 10

Learning Control / Examinations
The assessment is described for every course in this module. The overall score of the module is composed of the single scores of the courses weighted with their credits.

Prerequisites
None.

Conditions

- The course *Market Engineering* [26460] has to be attended.
- The course [26510p] could only be selected additionally to the course [26510].
- The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [26474] and itcan only be chosen in conjunction with the course [26474].

Learning Outcomes
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
- restructure and develop new business processes in markets under those conditions
- design and construct innovative business models and new forms of organisation for market provider or networks of market provider
- elaborate solutions in a team

Content
The courses of this module addresses the challenges of creating new kinds of markets and market information services in the context of new developed information and communication technologies. Innovative business processes, business models, form of organization and competition on and between market platforms are the major topics.

Courses in module *Information and Market Engineering* [IW4WWIMSE1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26460	Market Engineering: Information in Institutions	2/1	S	5	C. Weinhardt, J. Kraemer, C. van Dinther
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	5	C. Weinhardt, R. Riordan
26502	Electronic Markets (Principles)	2/1	W	5	A. Geyer-Schulz
26504	Electronic Markets: Institutions and Market Mechanisms	2/1	S	5	A. Geyer-Schulz
26510	Master Seminar in Information Engineering and Management	2	W	3	A. Geyer-Schulz
26510p	Practical Course in Information Engineering and Management (Master)	0*	W	2	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	4	C. Weinhardt
26477	Practical seminar Information Engineering and Management	0*	W/S	1	C. Weinhardt

Remarks
The course *Electronic Markets: Institutions and Market Mechanisms* will not be offered any more. An exam will be offered in september 2010.

Module: Service Engineering — Module key: [IW4WWIMSE2]

Subject: Economic Scienes
Module coordination: Christof Weinhardt, Andreas Geyer-Schulz
Credit points (CP): 10

Learning Control / Examinations
The assessment is described for every course in this module. The overall score of the module is composed of the single scores of the courses weighted with their credits.

Prerequisites
None.

Conditions

- It is recommended to combine the module *Service Engineering* with the module *Service Management* and the computer science module *Service Technologies*.
- It is recommended to attend course *Customer Relationship Management* [26508], if it has not already been attended during the bachelor studies.
- The course [26510p] could only be selected additionally to the course [26510].
- The practical seminar [26478] is a supplement to the course seminar Information Engineering and Management [26474] and itcan only be chosen in conjunction with the course [26474].

Learning Outcomes
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
- 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.

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. Real-world examples from e-Finance, personalized services, recommender systems and social platforms are presented in the courses.

Courses in module *Service Engineering* [IW4WWIMSE2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26508	Customer Relationship Management	2/1	W	5	A. Geyer-Schulz
26456	Business Models in the Internet: Planning and Implementation	2/1	S	5	C. Weinhardt, C. Holtmann, C. van Dinther
26460	Market Engineering: Information in Institutions	2/1	S	5	C. Weinhardt, J. Kraemer, C. van Dinther
26506	Personalization and Recommender Systems	2/1	S	5	A. Geyer-Schulz
26518	Social Network Analysis in CRM	2/1	W/S	5	B. Hoser
26510	Master Seminar in Information Engineering and Management	2	W	3	A. Geyer-Schulz
26510p	Practical Course in Information Engineering and Management (Master)	0*	W	2	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	4	C. Weinhardt
26477	Practical seminar Information Engineering and Management	0*	W/S	1	C. Weinhardt
26470	Seminar Service Science, Management & Engineering	2	W/S	4	S. Tai, C. Weinhardt, G. Satzger, R. Studer

Remarks
None.

Module: Service Management — Module key: [IW4WWSER1]

Subject: Economic Scienes
Module coordination: Gerhard Satzger, Christof Weinhardt
Credit points (CP): 10

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

Prerequisites
None.

Conditions

- The course *Business and IT Service Management* [26484] is mandatory.
- It is recommended to attend course *eServices* [26466], if it has not already been attended during the bachelor studies.
- The *practical seminar* [26478] is a supplement to the course *seminar Information Engineering and Management* [SemIW] and it can only be chosen in conjunction with the course.

Learning Outcomes
The student should learn to

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- analyze and develop supply chain networks, 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 analyze and develop supply chain networks as well as to understand and analyze innovation processes in corporations. Current examples from research and industry demonstrate the relevance of the topics discussed in this module.

Courses in module *Service Management* [IW4WWSER1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26484	Business and IT Service Management	2/1	W	5	G. Satzger
26466	eServices	2/1	S	5	C. Weinhardt, G. Satzger
26452	Management of Business Networks	2/1	W	5	C. Weinhardt, J. Kraemer
26468	Service Innovation	2/1	S	5	G. Satzger, A. Neus
26470	Seminar Service Science, Management & Engineering	2	W/S	4	S. Tai, C. Weinhardt, G. Satzger, R. Studer
SemIW	Seminar Information Engineering and Management	2	W/S	4	C. Weinhardt
26477	Practical seminar Information Engineering and Management	0*	W/S	1	C. Weinhardt

Module: Marketing

Module key: [IW4WWMAR]

Subject: Economic Scienes
Module coordination: Wolfgang Gaul
Credit points (CP): 20

Learning Control / Examinations
The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 240 min. and contains topics from at least two of four main lectures [25154], [25156], [25158] and [25171] as well as from the chosen lectures. The examination is offered every semester. Re-examinations are offered at every ordinary examination date and has to be absolved within one year.
The overall grade for the module is the average of the grades for each course weighted by the credits of the course.
It is recommended, to attend more lectures than required to fulfill 20 Credit Points as it is possible to examine in these additional lecutres and influence the final grade positively.
If a Seminar is attended within the module, the assessment for this course is done individually (according to §4, Abs. 2, Nr. 3 of the examination regulation). The grade of the seminar is taking into account for the overall grade of the module.

Prerequisites
None.

Conditions
At least two courses out of *Modern Market Research* [25154], *Marketing and Operations Reseach* [25156] and *Corporate Planning and Operations Research* [25171] have to be chosen.

Learning Outcomes

Content

Courses in module *Marketing* [IW4WWMAR]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	5	W. Gaul
25156	Marketing and Operations Research	2/1	S	5	W. Gaul
25158	Corporate Planning and Operations Research	2/1	W	5	W. Gaul
25171	Data Analysis and Operations Research	2/1	W	5	W. Gaul
25160	e-Business & electronic Marketing	1	S	2.5	W. Gaul
25162	Information Technology and Business Information	2/1	S	5	B. Neibecker
25164	International Marketing	1	S	2.5	W. Gaul
25165	Marketing and Innovation	1/1	W	2.5	W. Gaul
25166	Strategic and Innovative Decision Making in Marketing	2/1	S	5	B. Neibecker
25167	Behavioral Approaches in Marketing	2/1	W	5	B. Neibecker
25170	Entrepreneurship and Marketing	1/1	W	2.5	W. Gaul

Module: Marketing Research — Module key: [IW4WWMAR1]

Subject: Economic Scienes
Module coordination: Wolfgang Gaul
Credit points (CP): 10

Learning Control / Examinations
The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from at least one main lecture [25154] and [25171] as well as from the chosen lectures. The examination is offered every semester. Re-examinations are offered at every ordinary examination date and has to be absolved within one year.
The overall grade for the module is the average of the grades for each course weighted by the credits of the course.
It is recommended, to attend more lectures than required to fulfill 10 Credit Points as it is possible to examine in these additional lecutres and influence the final grade positively.
If a Seminar is attended within the module, the assessment for this course is done individually (according to §4, Abs. 2, Nr. 3 of the examination regulation). The grade of the seminar is taking into account for the overall grade of the module.

Prerequisites
None.

Conditions
The courses *Modern Market Research* [25154] oder *Data Analysis and Operations Research* [25171] have to be chosen.

Learning Outcomes

Content

Courses in module *Marketing Research* [IW4WWMAR1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	5	W. Gaul
25171	Data Analysis and Operations Research	2/1	W	5	W. Gaul
25160	e-Business & electronic Marketing	1	S	2.5	W. Gaul
25164	International Marketing	1	S	2.5	W. Gaul
25165	Marketing and Innovation	1/1	W	2.5	W. Gaul
25170	Entrepreneurship and Marketing	1/1	W	2.5	W. Gaul

Module: Quantitative Marketing and OR — Module key: [IW4WWMAR2]

Subject: Economic Scienes
Module coordination: Wolfgang Gaul
Credit points (CP): 10

Learning Control / Examinations
The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examination is offered every semester. Re-examinations are offered at every ordinary examination date and has to be absolved within one year.
The overall grade for the module is the average of the grades for each course weighted by the credits of the course.
It is recommended, to attend more lectures than required to fulfill 10 Credit Points as it is possible to examine in these additional lecutres and influence the final grade positively.
If a Seminar is attended within the module, the assessment for this course is done individually (according to §4, Abs. 2, Nr. 3 of the examination regulation). The grade of the seminar is taking into account for the overall grade of the module.

Prerequisites
none

Conditions
None.

Learning Outcomes

Content

Courses in module *Quantitative Marketing and OR* [IW4WWMAR2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	5	W. Gaul
25156	Marketing and Operations Research	2/1	S	5	W. Gaul
25158	Corporate Planning and Operations Research	2/1	W	5	W. Gaul
25171	Data Analysis and Operations Research	2/1	W	5	W. Gaul

Module: Behavioral Approaches in Marketing and Data Analysis [IW4WWMAR3] Module key:

Subject: Economic Scienes
Module coordination: Bruno Neibecker
Credit points (CP): 10

Learning Control / Examinations
Assessment consist of a written module exam according to §4 Abs. 2, Nr. 1 of the Prüfungsordnung für Informationswirtschaft. The module exam has a duration of 120 min. and contains topics from the main lecture [25167] as well as from one of the chosen lectures [25154] and [25162].
The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
None.

Conditions
- The lecture *Behavioral Approaches in Marketing* [25167] has to be attended.
- From the lectures *Modern Market Research* [25154] and *Information Technology and Business Information* [25162], one must be attended.
- At least 10 CP must be achieved.

Learning Outcomes
- To specify the key terms in marketing and communication management
- To identify and define theoretical constructs in marketing communication, based on behavioral theory
- To indentify the main research trends
- To analyze and interpret high level academic articles
- To learn interactive skills to work in teams and to follow a goal-oriented approach
- To gain understanding of methodological research to develop concrete plans for marketing decision-making

Content
Consumer behavior approaches in Marketing are seen as an important research area with a consumer-based perspective including a strong interdisciplinary and empirical orientation. My goal was to create a marketing module that presents a balanced coverage of both qualitative and quantitative material. That is, a practical, managerial perspective is discussed in relation to psychological, sociological and physiological (neuromarketing) approaches. It is examined how the individual receives information from his or her environment and how this material is learned, stored in memory, and used to form attitudes and to make decisions. A conprehensive understanding of marketing research and marketing data analysis is provided throughout the module, as for example in market segmentation or the definition of a target market a company decides to pursue.

Courses in module *Behavioral Approaches in Marketing and Data Analysis* [IW4WWMAR3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25167	Behavioral Approaches in Marketing	2/1	W	5	B. Neibecker
25154	Modern Market Research	2/1	S	5	W. Gaul
25162	Information Technology and Business Information	2/1	S	5	B. Neibecker

Module: Strategy, Innovation and Data Analysis Module key: [IW4WWMAR4]

Subject: Economic Scienes
Module coordination: Bruno Neibecker
Credit points (CP): 10

Learning Control / Examinations
Assessment consist of a written module exam according to §4 Abs. 2, Nr. 1 of the Prüfungsordnung für Informationswirtschaft. The module exam has a duration of 120 min. and contains topics from the main lecture [25166] as well as from one of the chosen lectures [25154] and [25162].
The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites
None.

Conditions
- The lecture *Strategic and Innovative Decision Making in Marketing* [25166] has to be attended.
- From the lectures *Modern Market Research* [25154] and *Information Technology and Business Information* [25162], one must be attended.
- At least 10 CP must be achieved.

Learning Outcomes
- To specify the key terms in strategic management and innovation research, based on methodological and behavioral approaches
- To apply statistical tools to analyze and interpret case specific problems in marketing
- To indentify the main research trends
- To analyze and interpret high level academic articles
- To learn interactive skills to work in teams and to follow a goal-oriented approach
- To gain understanding of methodological research to develop concrete plans for marketing decision-making

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 success factors 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.

Courses in module *Strategy, Innovation and Data Analysis* [IW4WWMAR4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25166	Strategic and Innovative Decision Making in Marketing	2/1	S	5	B. Neibecker
25154	Modern Market Research	2/1	S	5	W. Gaul
25162	Information Technology and Business Information	2/1	S	5	B. Neibecker

Module: Stochastic Methods in Economics and Engineering Module key: [IW4WWOQM1]

Subject: Economic Scienes
Module coordination: Karl-Heinz Waldmann
Credit points (CP): 10

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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The students aquire the ability to master the modern use of statistical methods for quality control and improvement. This includes a sound understanding of the principles and the basis for applying those principles in a wide variety of both product and nonproduct situations.

Content
The courses Statistical Quality Control I and II are about the modern use of statistical methods for quality control and improvement. Main topics are statistical process control, acceptance sampling, process design and improvement with designed experiments, reliability theory. The course optimization in a random environment deals with the quantitative analysis of selected problems arising in economics, engineering, and applied sciences.

Courses in module *Stochastic Methods in Economics and Engineering* [IW4WWOQM1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25674	Quality Control I	2/1/2	W	5	K. Waldmann
25659	Quality Control II	2/1/2	S	5	K. Waldmann
25687	Optimization in a Random Environment	2/1/2	W/S	5	K. Waldmann

Remarks
The lectures of the module are offered irregularly. The curriculum of the next two years is available online.
Credit from the voluntary computer lab in Quality Control I and II is accounted for in the overall grade raising the exam grade by 1/3 each.

Module: Business Organization: Theory and Management Perspective [IW4WWORG]

Module key:

Subject: Economic Scienes
Module coordination: Hagen Lindstädt
Credit points (CP): 20

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

Prerequisites
None.

Conditions
Students must attend the three courses [25902], [25904] and [25912] and the course [26291] or one seminar, [25915] or [25916] additionally.

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

Content
The module emphasises three aspects: The student will learn models and frameworks of the theory of organization. Additionally, the module deals with problems and questions concerning value based corporate management as an important part in strategic management. Finally, the module provides knowledge about concepts of organizational management and their practical application.

Courses in module *Business Organization: Theory and Management Perspective* [IW4WWORG]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25902	Managing Organizations	2/0	W	4	H. Lindstädt
25904	Organization Theory	2/1	W	6	H. Lindstädt
25907	Special Topics in Management: Management and IT	1/0	W/S	2	H. Lindstädt
25912	Value-Based Instruments of Corporate Strategy	2	W	4	U. Pidun, M. Wolff
26291	Managing New Technologies	2/1	S	5	T. Reiß
25915/25916	Seminar: Management and Organization	2	W/S	4	H. Lindstädt

Module: Strategy and Organization — Module key: [IW4WWORG1]

Subject: Economic Scienes
Module coordination: Hagen Lindstädt
Credit points (CP): 10

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

Prerequisites
None.

Conditions
Alle Veranstaltungen des Moduls müssen besucht werden.

Learning Outcomes
The module provides knowledge and skills about economic models and management frameworks in strategic management and managing organizations.
The module focuses on problem solving skills and understanding fundamental economic concepts in the area of strategy and organization.

Content
The module emphasises three aspects: The student will 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.

Courses in module *Strategy and Organization* [IW4WWORG1]

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

Module: Operational Risik Management — Module key: [IW4WWORM]

Subject: Economic Scienes
Module coordination: Ute Werner
Credit points (CP): 10

Learning Control / Examinations
The assessment is described for every course in this module. The overall score of the module is composed of the single scores of the courses weighted with their credits.

Prerequisites
Keine.

Conditions
One of the courses *Principles of Insurance Management* [25055] and *Multidisciplinary Risk Research* [26328] has to be chosen.

Learning Outcomes
Identifying specific risk concepts for various disciplines; comparative analysis of risks, depending on to the natural, technological and social environment; examining processes of risk perception, risk assessment and risk-taking behaviour by applying quantitative and qualitative methods; gaining insight into risk management from an individual, institutional and global perspective including strategies and instruments of risk management employed; understanding the particular importance of insurance for risk management and the economic principles of insurance business.

Content
Operational risks of institutions resulting from the interaction of human, technical, and organisational factors (internal risks) as well as from external natural, technical, social or political incidents; specific requirements, legal and economic framework of various risk carriers (private and public households, small and major enterprises), design of strategies and risk management instruments for coping with risks.

Courses in module *Operational Risik Management* [IW4WWORM]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26328	Multidisciplinary Risk Research	3/0	W/S	4.5	U. Werner
25055	Principles of Insurance Management	3/0	S	4	U. Werner
26326	Enterprise Risk Management	3/0	W	4.5	U. Werner
26354	Risk Management of Microfinance and Private Households	3/0	W/S	4.5	U. Werner
26355	Public Sector Risk Management	2/0	W/S	2,5	R. Mechler
26353	International Risk Transfer	2/0	S	2,5	W. Schwehr

Remarks
The courses *Enterprise Risk Management* [26326] and *Risk Management of Microfinance and Private Households* [26354] are offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de

Module: Stochastic Modeling and Optimization — Module key: [IW4WWSSMI]

Subject: Economic Scienes
Module coordination: Karl-Heinz Waldmann
Credit points (CP): 10

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

Prerequisites
None.

Conditions
None.

Learning Outcomes
The students aquire the ability to see and to analyse stochastic interrelations in their professional life. This includes a sound understanding of modeling, analysing and optimizing stochastic systems from an application-oriented point of view.

Content
See Lectures

Courses in module *Stochastic Modeling and Optimization* [IW4WWSSMI]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25662	Simulation I	2/1/2	W	5	K. Waldmann
25665	Simulation II	2/1/2	S	5	K. Waldmann
25679	Markov Decision Models I	2/1/2	W	4	K. Waldmann
25682	Markov Decision Models II	2/1/2	S	5	K. Waldmann
25369	Game Theory II	2/2	W	6	S. Berninghaus

Remarks
The lectures *Markov Decision Models II, Simulation I* [25662], and *Simulation II* [25665] are offered irregularly. The curriculum of the next two years is available online.
Credit from the voluntary computer lab in *Markov Decision Models I, Markov Decision Models II, Simulation I* [25662], and *Simulation II* [25665] is accounted for in the overall grade raising the exam grade by 1/3 each.

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Prüfungs- und Studienordnung der Universität Karlsruhe (TH) für den Master-Studiengang Informationswirtschaft

vom 30. April 2006

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.

Aufgrund von §34 Abs. 1, Satz 1 des Landeshochschulgesetzes (LHG) vom 1. Januar 2005 hat der Senat der Universität Karlsruhe (TH) am 25. April 2006 die folgende Studien- und Prüfungsordnung für den Master-Studiengang Informationswirtschaft beschlossen.

Der Rektor hat seine Zustimmung am 30. April 2006 erteilt.

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