

Module Handbook Business Engineering (M.Sc.)

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1 Structure of the Master Programme in Business Engineering (M.Sc.)

The master programme in Business Engineering (M.Sc.) has 4 terms and consists of 120 credits (CP) including Master's thesis. The master programme further deepens or complements the scientific qualifications acquired in the bachelor programme. The students should be made capable of independently applying scientific knowledge and methods and evaluate their implications and scope concerning solutions of complex scientific and social problems. Furthermore, the student has to attend two seminars with a minimum of six CP within the seminar module. In addition to the key skills gained in the seminars (3 CP), the student has to acquire additional key skills totalling at least 3 credits.

Business Engineering (M.Sc.)										
Semester	Compulsory								Elective	
1	BA	BA	EC	INFO	OR	ENG	ENG	Seminar + KS	Elective	Elective
2										
3	9 CP	9 CP	9 CP	9 CP	9 CP	9 CP	9 CP	6 + 3 CP	9 CP	9 CP
4	Master Thesis 30 CP									
120 CP (8 compulsory modules + 2 elective modules + Master Thesis)										

Abbildung 1: Structure of the Master Programme (Recommendation)

Figure 1 shows the structure of the subjects and the credits allocated to the subjects. The student has to choose two elective modules of the following disciplines: Business science, economics, informatics, operations research, engineering science, statistics, law and sociology. In principle, both elective modules are also available in one discipline. Thereby it is only allowed to choose either one module in law or in sociology.

It is left to the student's individual curriculum (taking into account the examination and module regulations), in which terms the chosen modules will be started and completed. However, it is highly recommended to complete all courses and seminars before beginning the Master's thesis.

2 Key Skills

The master programme Business Engineering (M.Sc.) at the Faculty of Economics and Business Engineering distinguishes itself by an exceptionally high level of interdisciplinarity. With the combination of business science, economics, informatics, operations research, mathematics as well as engineering and natural science, the integration of knowledge of different disciplines is an inherent element of the programme. As a result, interdisciplinary and connected thinking is encouraged in a natural way. Furthermore, the seminar courses in the master degree programme contribute significantly to the development of key skills by practicing to elaborate and write scientifically sound papers and presentations about special topics. The *integrative* taught key skills, which are acquired throughout the entire programme, can be classified into the following fields:

Soft skills

1. Team work, social communication and creativity techniques
2. Presentations and presentation techniques
3. Logical and systematical arguing and writing
4. Structured problem solving and communication

Enabling skills

1. Decision making in business context
2. Project management competences
3. Fundamentals of business science
4. English as a foreign language

Orientalional knowledge

1. Acquisition of interdisciplinary knowledge
2. Institutional knowledge about economic and legal systems
3. Knowledge about international organisations
4. Media, technology and innovation

The integrative acquisition of key skills especially takes place in several obligatory courses during the master programme, namely

1. Seminar module
2. Mentoring of the Master's thesis
3. Business science, economics and informatics modules

Figure 2 shows the classification of key skills within the master program at a glance.

Besides the integrated key skills, the additive acquisition of key skills, which are totalling at least three credits within the seminar module, is scheduled. A list of recommended courses and seminars will be published online for the additive acquisition. This list is coordinated with the House of Competence.

Art der Schlüsselqualifikation	Masterstudium				
	BWL	VWL	INFO	Seminar	Materarbeit
Basiskompetenzen (soft skills)					
Teamarbeit, soziale Kommunikation und Kreativitätstechniken			x		
Präsentationserstellung und -techniken				x	
Logisches und systematisches Argumentieren und Schreiben				x	x
Strukturierte Problemlösung und Kommunikation				x	x
Praxisorientierung (enabling skills)					
Handlungskompetenz im beruflichen Kontext					(x)*
Kompetenzen im Projektmanagement					(x)*
Betriebswirtschaftliche Grundkenntnisse	x				
Englisch als Fachsprache	x	x			
Orientierungswissen					
Interdisziplinäres Wissen	x	x	x	x	(x)*
Institutionelles Wissen über Wirtschafts- und Rechtssysteme		x			
Wissen über internationale Organisationen		x			
Medien, Technik und Innovation		x	x		

(x)*ist nicht zwingend SQ-vermittelnd; hängt von der Art der Aktivität ab (z.B. Auslandspraktikum, thematische Ausrichtung der Masterarbeit)

Abbildung 2: Key Skills

3 Module Handbook - a helpful guide throughout the studies

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

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

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

Begin and completion of a module

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

General exams and partial exams

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

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

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

Repeating exams

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

Bonus accomplishments and additional accomplishments

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

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

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

Further information

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

Used abbreviations

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

4 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.

Business & Service Engineering [WI4BWLISM4] (S. 34)

Anmerkungen

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10.

Information Engineering [WI4BWLISM7] (S. 37)

Anmerkungen

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10.

Network Economics [WI4VWL4] (S. 47)

Anmerkungen

This module continues the old module *Network Economies* by Prof. Rothengatter. Dr. Kopp's lecture *Regulation* [26206] (held for the last time in the WT 09/10) is substituted by the lecture *Regulation Theory and Practice* [26234] by Prof. Mitusch (held for the first time in the ST 10); only one of these lectures can be taken into account. Beginning in the WT 2009/2010, the lecture *Competition in Networks* [26240] will always be held during the winter term.

Mathematical Programming [WI4OR6] (S. 62)

Anmerkungen

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

Special Topics in Optimization [WI4OR7] (S. 63)

Anmerkungen

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

Optimization in Practice [WI4OR2] (S. 64)

Anmerkungen

The module was offered in summer term 2009 for the last time.

Control Engineering I [WI4INGETIT1] (S. 98)

Anmerkungen

Seminar Module [WW4SEM] (S. 122)

Bedingungen

The seminars must be offered by a representative of the School of Economics and Business Engineering. Alternatively one of the two compulsory seminars can be absolved at a engineering department or at the Department of Mathematics. The seminar has to be offered by a representative of the respective departments as well. The assessment has to meet the demands of the School of Economics and Business Engineering (active participation, term paper with a workload of at least 80 h, presentation). A seminar at another Department than the School of Economics and Business Engineering requires an official approval at all and can be applied at the examination office of the School of Economics and Business Engineering. Seminars at the wbk and the IFL will not requiring these official approval.

Anmerkungen

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the Universität Karlsruhe (TH). In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

5 Modules

5.1 Business Administration

Module: F1 (Finance)

Module key: [WI4BWLFBV1]

Subject: Business Administration

Module coordination: Marliese Uhrig-Homburg, Martin E. Ruckes

Credit points (CP): 9

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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.

Courses in module F1 (Finance) [WI4BWLFBV1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26550	Derivatives	2/1	S	4.5	Uhrig-Homburg
25212	Valuation	2/1	W	4.5	Ruckes
26555	Asset Pricing	2/1	S	4.5	Uhrig-Homburg, Ruckes

Module: F2 (Finance)**Module key: [WI4BWLFBV2]****Subject:** Business Administration**Module coordination:** Marliese Uhrig-Homburg, Martin E. Ruckes**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2), 1 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.

Prerequisites

None.

Conditions

It is obligatory to attend the module *F1 (Finance)* [EE4BWLFBV1].

It is not allowed to choose also the module *F2&F3 (Finance)* [WI4BWLFBV3].

The courses *Asset Pricing* [VLAP], *Valuation* [25212] and *Derivatives* [26550] can only be chosen if they have not been chosen in the module *F1 (Finance)* [WI4BWLFBV1] already.

Learning Outcomes

The student has advanced skills in economics and methodology in the field of modern finance.

Content

The module F2 (Finance) is based on the module F1 (Finance). 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.

Courses in module F2 (Finance) [WI4BWLFBV2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26560	Fixed Income Securities	2/1	W	4.5	Uhrig-Homburg
25214	Corporate Financial Policy	2/1	S	4.5	Ruckes
25240	Market Microstructure	2/0	W	3	Lüdecke
26565	Credit Risk	2/1	W	4.5	Uhrig-Homburg
25210	Management Accounting	2/1	S	4.5	Lüdecke
26555	Asset Pricing	2/1	S	4.5	Uhrig-Homburg, Ruckes
25212	Valuation	2/1	W	4.5	Ruckes
26550	Derivatives	2/1	S	4.5	Uhrig-Homburg
26570	International Finance	2	S	3	Uhrig-Homburg, Walter
25299	Business Strategies of Banks	2	W	3	Müller
25296	Exchanges	1	S	1.5	Franke
25232	Financial Intermediation	3	W	4.5	Ruckes

Remarks

Module: F2&F3 (Finance)**Module key: [WI4BWLFBV3]****Subject:** Business Administration**Module coordination:** Marliese Uhrig-Homburg, Martin E. Ruckes**Credit points (CP):** 18**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.

Prerequisites

None.

Conditions

It is obligatory to attend the module *F1 (Finance)* [EE4BWLFBV1].

It is not allowed to choose also the module *F2&F3 (Finance)* [WI4BWLFBV3].

The courses *Asset Pricing* [VLAP], *Valuation* [25212] and *Derivatives* [26550] can only be chosen if they have not been chosen in the module *F1 (Finance)* [WI4BWLFBV1] already.

Learning Outcomes

The student has advanced skills in economics and methodology in the field of finance.

Content

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.

Courses in module F2&F3 (Finance) [WI4BWLFBV3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26555	Asset Pricing	2/1	S	4.5	Uhrig-Homburg, Ruckes
25212	Valuation	2/1	W	4.5	Ruckes
26550	Derivatives	2/1	S	4.5	Uhrig-Homburg
26560	Fixed Income Securities	2/1	W	4.5	Uhrig-Homburg
26565	Credit Risk	2/1	W	4.5	Uhrig-Homburg
25214	Corporate Financial Policy	2/1	S	4.5	Ruckes
25240	Market Microstructure	2/0	W	3	Lüdecke
25210	Management Accounting	2/1	S	4.5	Lüdecke
25232	Financial Intermediation	3	W	4.5	Ruckes
25296	Exchanges	1	S	1.5	Franke
25299	Business Strategies of Banks	2	W	3	Müller
26570	International Finance	2	S	3	Uhrig-Homburg, Walter

**Module: Entrepreneurship, Innovation and International Marketing
[WI4BWL MAR6]**

Module key:

Subject: Business Administration

Module coordination: Wolfgang Gaul

Credit points (CP): 9

Learning Control / Examinations

The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from at least two of the main lectures [25164], [25165] and [25170] 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 9 Credit Points as it is possible to examine in these additional lectures and influence the final grade positively.

Prerequisites

None.

Conditions

At least two courses out of International Marketing [25164], Marketing and Innovation [25165] and Entrepreneurship and Marketing [25170] have to be chosen.

Learning Outcomes

Content

Courses in module *Entrepreneurship, Innovation and International Marketing* [WI4BWL MAR6]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	4.5	Gaul
25156	Marketing and Operations Research	2/1	S	4.5	Gaul
25158	Corporate Planning and Operations Research	2/1	W	4.5	Gaul
25171	Data Analysis and Operations Research	2/1	W	4.5	Gaul
25160	e-Business & electronic Marketing	1	S	2.5	Gaul
25164	International Marketing	1	S	2.5	Gaul
25165	Marketing and Innovation	1/1	W	2.5	Gaul
25170	Entrepreneurship and Marketing	1/1	W	2.5	Gaul

Module: Marketing Planning**Module key: [WI4BWLMAR1]****Subject:** Business Administration**Module coordination:** Wolfgang Gaul**Credit points (CP):** 9**Learning Control / Examinations**

The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from at least one of the main lectures [25156] und [25158] 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 9 Credit Points as it is possible to examine in these additional lectures and influence the final grade positively.

Prerequisites

None.

Conditions

The courses *Marketing and Operations Research* [25156] and *Corporate Planning and Operations Research* [25158] have to be chosen.

Learning Outcomes**Content****Courses in module *Marketing Planning* [WI4BWLMAR1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25156	Marketing and Operations Research	2/1	S	4.5	Gaul
25158	Corporate Planning and Operations Research	2/1	W	4.5	Gaul
25160	e-Business & electronic Marketing	1	S	2.5	Gaul
25164	International Marketing	1	S	2.5	Gaul
25165	Marketing and Innovation	1/1	W	2.5	Gaul
25170	Entrepreneurship and Marketing	1/1	W	2.5	Gaul

Module: Market Research**Module key: [WI4BWL MAR2]****Subject:** Business Administration**Module coordination:** Wolfgang Gaul**Credit points (CP):** 9**Learning Control / Examinations**

The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from at least one of the main lectures [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 9 Credit Points as it is possible to examine in these additional lectures and influence the final grade positively.

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 *Market Research* [WI4BWL MAR2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	4.5	Gaul
25171	Data Analysis and Operations Research	2/1	W	4.5	Gaul
25160	e-Business & electronic Marketing	1	S	2.5	Gaul
25164	International Marketing	1	S	2.5	Gaul
25165	Marketing and Innovation	1/1	W	2.5	Gaul
25170	Entrepreneurship and Marketing	1/1	W	2.5	Gaul

Module: Strategy, Innovation and Data Analysis**Module key: [WI4BWL MAR3]****Subject:** Business Administration**Module coordination:** Bruno Neibecker**Credit points (CP):** 9**Learning Control / Examinations**

Assessment consist of a written module exam according to §4(2), 1 SPO. 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 9 CP must be achieved.

Learning Outcomes

Students have learned the following outcomes and competences:

- 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 identify 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* [WI4BWL MAR3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25166	Strategic and Innovative Decision Making in Marketing	2/1	S	4.5	Neibecker
25154	Modern Market Research	2/1	S	4.5	Gaul
25162	Information Technology and Business Information	2/1	S	4.5	Neibecker

Module: Behavioral Approaches in Marketing and Data Analysis [WI4BWL MAR4]

Module key:

Subject: Business Administration

Module coordination: Bruno Neibecker

Credit points (CP): 9

Learning Control / Examinations

Assessment consist of a written module exam according to §4(2), 1 SPO. 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 9 CP must be achieved.

Learning Outcomes

Students have learned the following outcomes and competences:

- 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 comprehensive 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* [WI4BWL MAR4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25167	Behavioral Approaches in Marketing	2/1	W	4.5	Neibecker
25154	Modern Market Research	2/1	S	4.5	Gaul
25162	Information Technology and Business Information	2/1	S	4.5	Neibecker

Module: Successful Market Orientation**Module key: [WI4BWL MAR5]****Subject:** Business Administration**Module coordination:** Wolfgang Gaul**Credit points (CP):** 18**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 18 Credit Points as it is possible to examine in these additional lectures and influence the final grade positively.

Prerequisites

None.

Conditions

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

Learning Outcomes**Content****Courses in module *Successful Market Orientation* [WI4BWL MAR5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	4.5	Gaul
25156	Marketing and Operations Research	2/1	S	4.5	Gaul
25158	Corporate Planning and Operations Research	2/1	W	4.5	Gaul
25171	Data Analysis and Operations Research	2/1	W	4.5	Gaul
25160	e-Business & electronic Marketing	1	S	2.5	Gaul
25164	International Marketing	1	S	2.5	Gaul
25165	Marketing and Innovation	1/1	W	2.5	Gaul
25170	Entrepreneurship and Marketing	1/1	W	2.5	Gaul
25166	Strategic and Innovative Decision Making in Marketing	2/1	S	4.5	Neibecker
25167	Behavioral Approaches in Marketing	2/1	W	4.5	Neibecker
25162	Information Technology and Business Information	2/1	S	4.5	Neibecker

Module: Strategic Corporate Management and Organization Module key: [WI4BWL01]

Subject: Business Administration

Module coordination: Hagen Lindstädt

Credit points (CP): 9

Learning Control / Examinations

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

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

Prerequisites

None.

Conditions

One of the following courses have to be attended: *Managing Organizations* [25902], *Management and Strategy* [25900]

Learning Outcomes

Content

Courses in module *Strategic Corporate Management and Organization* [WI4BWL01]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25904	Organization Theory	2/1	W	6	Lindstädt
25902	Managing Organizations	2/0	W	4	Lindstädt
25908	Modeling Strategic Decision Making	2/1	S	6	Lindstädt
25912	Value-Based Instruments of Corporate Strategy	2	W	4	Pidun, Wolff
25900	Management and Strategy	2/0	S	4	Lindstädt

Module: Strategic Decision Making and Organization Theory **Module key: [WI4BWL03]****Subject:** Business Administration**Module coordination:** Hagen Lindstädt**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Strategic Decision Making and Organization Theory* [WI4BWL03]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25904	Organization Theory	2/1	W	6	Lindstädt
25908	Modeling Strategic Decision Making	2/1	S	6	Lindstädt
25912	Value-Based Instruments of Corporate Strategy	2	W	4	Pidun, Wolff

Module: Applications of Actuarial Sciences I (BWL)**Module key: [WI4BWLFBV4]****Subject:** Business Administration**Module coordination:** Christian Hipp**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge in statistics and the module *Insurance: Calculation and Control* [WW3BWLFBV2] is an advantage, but not a requirement.

Conditions

Two courses out of *Life and Pensions* [26310], *Reinsurance* [26312], *Insurance Optimisation* [26316] and *Saving Societies* [26340] have to be chosen.

Learning Outcomes**Content****Courses in module *Applications of Actuarial Sciences I (BWL)* [WI4BWLFBV4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26340	Saving Societies	3/0	S	4,5	Hipp, N.N.
26316	Insurance Optimisation	3	W	4.5	Hipp
26312	Reinsurance	4	S	4.5	Hipp, Stöckbauer
26310	Life and Pensions	3	W	4.5	Hipp, Vogt, Besserer

Remarks

Module: Applications of Actuarial Sciences II (BWL)**Module key: [WI4BWLFBV5]****Subject:** Business Administration**Module coordination:** Christian Hipp**Credit points (CP):** 18**Learning Control / Examinations**

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

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

Prerequisites

Knowledge in statistics and the module *Insurance: Calculation and Control* [WW3BWLFBV2] is an advantage, but not a requirement.

Conditions

All courses of the module have to be attended.

Learning Outcomes**Content****Courses in module *Applications of Actuarial Sciences II (BWL)* [WI4BWLFBV5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26310	Life and Pensions	3	W	4.5	Hipp, Vogt, Besserer
26312	Reinsurance	4	S	4.5	Hipp, Stöckbauer
26340	Saving Societies	3/0	S	4,5	Hipp, N.N.
26316	Insurance Optimisation	3	W	4.5	Hipp

Remarks

Module: Insurance Statistics**Module key: [WI4BWLFBV8]****Subject:** Business Administration**Module coordination:** Christian Hipp**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

Knowledge in statistics and the module *Insurance: Calculation and Control* [WW3BWLFBV2] is an advantage, but not a requirement.

Conditions

None.

Learning Outcomes**Content****Courses in module *Insurance Statistics* [WI4BWLFBV8]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26303	Insurance Statistics	4/2	W	9	Hipp

Module: Operational Risk Management I**Module key: [WI4BWLFBV9]****Subject:** Business Administration**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge in risk management (for example gained in the Bachelor programme) are an advantage.

Conditions

It is only possible to choose the course *Enterprise Risk Management* [26326] if it was not attended in the Bachelor programme. Good complements to this module are as well the engineering science modules *Understanding and Prediction of Disasters I* [WI4INTER1] and *Safety Science I* [WI4INTER4].

Learning Outcomes**Content****Courses in module *Operational Risk Management I* [WI4BWLFBV9]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26326	Enterprise Risk Management	3/0	W/S	4.5	Werner
26395	Risk Communication	3/0	W/S	4.5	Werner
26353	International Risk Transfer	2/0	S	2,5	Schwehr
26355	Public Sector Risk Management	2/0	W	2,5	Mechler

Remarks

The courses *Enterprise Risk Management* [26326] and *Risk Communication* [26395] are offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

Module: Operational Risk Management II**Module key: [WI4BWLFBV10]****Subject:** Business Administration**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Interest in interdisciplinary research is assumed.

Knowledge in social science disciplines, GIS or Finance is an advantage.

Conditions

Good complements to this module are as well the engineering science modules *Understanding and Prediction of Disasters I* [WI4INTER1] and *Safety Science I* [WI4INTER4].

Learning Outcomes**Content****Courses in module *Operational Risk Management II* [WI4BWLFBV10]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26355	Public Sector Risk Management	2/0	W	2,5	Mechler
26354	Risk Management of Microfinance and Private Households	3/0	W/S	4.5	Werner
26328	Multidisciplinary Risk Research	3/0	W/S	4.5	Werner
26393	Project Work in Risk Research	3	W/S	4.5	Werner

Remarks

The course *Risk Management of Microfinance and Private Households* [26354] is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

Module: Insurance Management I**Module key: [WI4BWLFBV6]****Subject:** Business Administration**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge of the content of the course *Principles of Insurance Management* [25055] (cf. Bachelor module *Risk and Insurance Management* [WW3BWLFBV3] or *Insurance Management* [WW3BWLFBV4] or lecture notes available at <http://insurance.fbv.uni-karlsruhe.de/345.php>) is assumed.

If the contents were not part of the Bachelor programme and there is no professional experience in the insurance industry so far, the student has to pass a test to proof sufficient prior knowledge in the first third of the term.

Conditions

None.

Learning Outcomes**Content****Courses in module *Insurance Management I* [WI4BWLFBV6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26323	Insurance Marketing	3/0	W/S	4.5	Werner
26320	Insurance Accounting	3/0	W	4.5	Werner, Ludwig
26324	Insurance Production	3/0	W/S	4.5	Werner
26327	Service Management	3/0	W/S	4.5	Werner
26360	Insurance Contract Law	3/0	S	4.5	Werner, Schwebler

Remarks

The courses *Insurance Marketing* [26323], *Insurance Production* [26324], and *Service Management* [26327] are offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

Module: Insurance Management II**Module key: [WI4BWLFBV7]****Subject:** Business Administration**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge of the content of the course *Principles of Insurance Management* [25055] (cf. Bachelor module *Risk and Insurance Management* [WW3BWLFBV3] or *Insurance Management* [WW3BWLFBV4] or lecture notes available at <http://insurance.fbv.uni-karlsruhe.de/345.php>) is assumed.

If the contents were not part of the Bachelor programme and there is no professional experience in the insurance industry so far, the student has to pass a test to proof sufficient prior knowledge in the first third of the term.

Conditions

None.

Learning Outcomes**Content****Courses in module *Insurance Management II* [WI4BWLFBV7]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25050	Private and Social Insurance	2/0	W	2.5	Werner, Heilmann, Besserer
26360	Insurance Contract Law	3/0	S	4.5	Werner, Schwebler
26350	Current Issues in the Insurance Industry	2/0	S	2.5	Werner, Heilmann
26335	Insurance Risk Management	2/0	S	2.5	Werner, Maser
26336	Risk Controlling in Insurance Groups	1/0	S	2	Werner, Müller

Module: Advanced CRM**Module key: [WI4BWLISM1]****Subject:** Business Administration**Module coordination:** Andreas Geyer-Schulz**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2), 1 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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,
- 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.

On one hand, 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.

On the other hand, 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.

Courses in module *Advanced CRM* [WI4BWLISM1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26508	Customer Relationship Management	2/1	W	4,5	Geyer-Schulz
26506	Personalization and Recommender Systems	2/1	S	4,5	Geyer-Schulz
26518	Social Network Analysis in CRM	2/1	W/S	4,5	Hoser

Module: Electronic Markets**Module key: [WI4BWLISM2]****Subject:** Business Administration**Module coordination:** Andreas Geyer-Schulz**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

The student

- knows 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.

Content

What are the conditions that make electronic markets develop?

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.

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

Further topics of the module include the analysis of existing markets, the design for new markets and the implementation of simple auction forms.

Courses in module *Electronic Markets* [WI4BWLISM2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26502	Electronic Markets (Principles)	2/1	W	4,5	Geyer-Schulz
26504	Electronic Markets: Institutions and Market Mechanisms	2/1	S	4,5	Geyer-Schulz
26460	Market Engineering: Information in Institutions	2/1	S	4,5	Weinhardt, Kraemer

Module: Market Engineering**Module key: [WI4BWLISM3]****Subject:** Business Administration**Module coordination:** Christof Weinhardt**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The course *Market Engineering: Information in Institutions* [26460] has to be attended.

Learning Outcomes

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* [26460] by discussing theories about mechanism design and institutional economics. The student can deepen his knowledge about markets in a second course.

Courses in module *Market Engineering* [WI4BWLISM3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26460	Market Engineering: Information in Institutions	2/1	S	4,5	Weinhardt, Kraemer
25408	Auction Theory	2/1	W	4.5	Ehrhart, Seifert
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4.5	Weinhardt, Riordan
26458	Computational Economics	2/1	W	5	Branke, van Dinther
25373	Experimental Economics	2/1	S	4,5	Berninghaus, Bleich

Module: Business & Service Engineering**Module key: [WI4BWLISM4]****Subject:** Business Administration**Module coordination:** Christof Weinhardt, Gerhard Satzger**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

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. This will be shown by actual examples from personalized services, recommender services and social networks.

Courses in module *Business & Service Engineering* [WI4BWLISM4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26456	Business Models in the Internet: Planning and Implementation	2/1	S	4,5	Weinhardt, Holtmann
26478	Special Topics in Information Engineering & Management	3	W/S	4.5	Weinhardt
26506	Personalization and Recommender Systems	2/1	S	4,5	Geyer-Schulz
26468	Service Innovation	2/1	S	5	Satzger, Neus

Remarks

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10.

Module: Communications & Markets**Module key: [WI4BWLISM5]****Subject:** Business Administration**Module coordination:** Christof Weinhardt**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The course *Communications Economics* [26462] has to be attended.

Learning Outcomes

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.

Courses in module *Communications & Markets* [WI4BWLISM5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26462	Communications Economics	2/1	S	4,5	Seifert, Kraemer
26460	Market Engineering: Information in Institutions	2/1	S	4,5	Weinhardt, Kraemer
25408	Auction Theory	2/1	W	4.5	Ehrhart, Seifert
26478	Special Topics in Information Engineering & Management	3	W/S	4.5	Weinhardt

Remarks

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10.

Module: Service Management**Module key: [WI4BWLISM6]****Subject:** Business Administration**Module coordination:** Gerhard Satzger, Christof Weinhardt**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The course *Business and IT Service Management* [26484] is obligatory.

The course *eServices* [26466] can only be chosen, if it was not attended in the Bachelor programme.

Learning Outcomes

The students

- understand the basics of developing and managing IT-based services,
- understand and apply OR methods in service management,
- analyze and develop supply chain and business networks,
- 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* [WI4BWLISM6]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26484	Business and IT Service Management	2/1	W	5	Satzger
26452	Management of Business Networks	2/1	W	4.5	Weinhardt, Kraemer
26468	Service Innovation	2/1	S	5	Satzger, Neus
26466	eServices	2/1	S	5	Weinhardt, Satzger

Module: Information Engineering**Module key: [WI4BWLISM7]****Subject:** Business Administration**Module coordination:** Christof Weinhardt**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The course *Principles of Information Engineering and Management* [26450] has to be taken.

Learning Outcomes

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,
- analyze and evaluate existing markets regarding the missing incentives and the optimal solution of a given market mechanism, respectively,
- develop solutions in teams.

Content

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 existence/generation through allocation and evaluation until the distribution and usage of information are analyzed from the business administration perspective and the microeconomic perspective.

In a second course the student can deepen his knowledge on the one hand on the design and operation of markets and on the other hand on the impact of digital goods in network industries regarding the pricing policies, business strategies and regulation issues. If chosen, the course *Special Topics in Information Engineering & Management* additionally provides an opportunity of practical research in the aforementioned range of subjects.

Courses in module *Information Engineering* [WI4BWLISM7]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26450	Principles of Information Engineering and Management	2/1	W	5	Weinhardt, Kraemer, van Dinter
26462	Communications Economics	2/1	S	4,5	Seifert, Kraemer
26460	Market Engineering: Information in Institutions	2/1	S	4,5	Weinhardt, Kraemer
26478	Special Topics in Information Engineering & Management	3	W/S	4.5	Weinhardt

Remarks

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10.

Module: Industrial Production II**Module key: [WI4BWLIIIP2]****Subject:** Business Administration**Module coordination:** Frank Schultmann**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations 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.

Prerequisites

None.

Conditions

The course *Planning and Management of Industrial Plants* [25952] is obligatory. In addition to that one more course has to be chosen.

Learning Outcomes**Content****Courses in module *Industrial Production II* [WI4BWLIIIP2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25952	Planning and Management of Industrial Plants	2/2	W	5.5	Schultmann
25962	Exhaust Emissions (VWL), Emissions into the Environment (ING)	2/0	W	3.5	Karl
25995	Material Flow Analysis and Life Cycle Assessment	2/0	W	3.5	Schebek

Module: Industrial Production III**Module key: [WI4BWLIIIP6]****Subject:** Business Administration**Module coordination:** Frank Schultmann**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The examinations 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Industrial Production III* [WI4BWLIIIP6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25954	Production and Logistics Management	2/2	S	5.5	Fröhling, Schultmann
25975	Computer-based Planning and Control of Production and Simulation of Processes	2/0	S	3.5	Fröhling, Möst, Schultmann
25963	The Management of R&D Projects with Case Studies	2/2	W/S	3.5	Schmied

Module: Basics of Liberalised Energy Markets**Module key: [WI4BWLIIIP4]****Subject:** Business Administration**Module coordination:** Wolf Fichtner**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Basics of Liberalised Energy Markets* [WI4BWLIIIP4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25998	Basics of Liberalised Energy Markets	2/1	W	3.5	Fichtner
26020	Energy Trade and Risk Management	2/1	S	3.5	Hufendiek
25959	Energy Policy	2/0	S	3.5	Wietschel
26022	Gas-Markets	2/0	W	3	Fichtner
26025	Simulation Game in Energy Economics	2/0	W	3	Fichtner
26234	Regulation Theory and Practice	2/1	S	4	Mitsch

Module: Energy Industry and Technology**Module key: [WI4BWLIP5]****Subject:** Business Administration**Module coordination:** Wolf Fichtner**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Energy Industry and Technology* [WI4BWLIP5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26003	Energy and Environment	2/1	S	5	Karl, n.n.
25958	Strategical Aspects of Energy Economy	2/0	W	3.5	Ardone
26000	Technological Change in Energy Industry	2/0	W	3	Wietschel
26001	Heat Economy	2/0	S	3	Fichtner
26002	Energy Systems Analysis	2/0	S	3	Möst

Module: Industrial Ergonomics**Module key: [WI4BWLIIIP1]****Subject:** Business Administration**Module coordination:** Peter Knauth**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Industrial Ergonomics* [WI4BWLIIIP1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25988	Changes in th Working World	2	W/S	3	Hornberger
25964	Ergonomics I	2/1	W	3	Knauth
25965	Ergonomics II	2/1	S	3	Karl
25967	Industrial Studies of Time and Motion	2	W	3	Dürschnabel

Module: Leadership / Change Management**Module key: [WI4BWLIP3]****Subject:** Business Administration**Module coordination:** Peter Knauth**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Leadership / Change Management* [WI4BWLIP3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25972	Human Resource Management I	2	W	3	Wollert
25973	Human Resource Management II	2	S	3	Wollert
25968	Social Relationships in Organisations	2	S	3	Kraus
25969	Development of Personnel and Organisation	2	W	3	Weisheit

5.2 Economics

Module: Innovation and Technical Change

Module key: [WI4VWL1]

Subject: Economics

Module coordination: Hariolf Grupp, N.N.

Credit points (CP): 9

Learning Control / Examinations

Prerequisites

It is helpful to have attended the course *Innovation* [26274] of the Bachelor programme..

Conditions

None.

Learning Outcomes

Content

Courses in module *Innovation and Technical Change* [WI4VWL1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26272	Economics of Innovation	2/2	W	6	Grupp
26291	Managing New Technologies	2/1	S	5	Reiß

Module: Applied Strategic Decisions**Module key: [WI4VWL2]****Subject:** Economics**Module coordination:** Siegfried Berninghaus, Clemens Puppe**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

The student should have basic knowledge of game theory.

Conditions

The course *Game Theory II* [25369] is obligatory. Exception: This lecture was completed in the Bachelor study programme.

Learning Outcomes

The student

- knows and analyzes complex strategic decisions, knows advanced formal solution concepts and how to apply them,
- knows basic solution concepts for simple strategic decisions and is able to apply them to concrete problems,
- knows the experimental method from design of an experiment to evaluation of data and applies them.

Content

The module offers various possibilities of application of game theoretic methods. The main focus is on strategic bargaining and behavior in auctions. Also empirical aspects are taken into account.

Courses in module *Applied Strategic Decisions* [WI4VWL2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25369	Game Theory II	2/2	W	4.5	Berninghaus
25525	Game Theory I	2/2	S	4.5	Berninghaus
25408	Auction Theory	2/1	W	4.5	Ehrhart, Seifert
26460	Market Engineering: Information in Institutions	2/1	S	4,5	Weinhardt, Kraemer
25373	Experimental Economics	2/1	S	4,5	Berninghaus, Bleich

Module: Money and Payment**Module key: [WI4VWL3]****Subject:** Economics**Module coordination:** Malte Krüger**Credit points (CP):** 9**Learning Control / Examinations**

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

Note the changes in course offering under “remarks”.

Prerequisites

Knowledge in the area of Macroeconomics is helpful.

Conditions

None.

Learning Outcomes**Content****Courses in module *Money and Payment* [WI4VWL3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26100	Monetary Theory	2/1	S	5	Krüger
26252	International Economics	2/1	W	5	Kowalski

Module: Network Economics**Module key: [WI4VWL4]****Subject:** Economics**Module coordination:** Kay Mitusch**Credit points (CP):** 9**Learning Control / Examinations**

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

The 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.

Note the changes in course offering under “remarks”.

Prerequisites

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

Conditions

In this module the lecture *Competition in Networks* [26240] (Prof. Mitusch) has to be attended and the test passed.

Learning Outcomes

The student

- recognizes the specific characterizations of Network Economics
- understands the interaction of infrastructures, control systems and users and he/she can simulate exemplary applications
- is able to evaluate actions in networks, e.g. investment, price and regulation politics
- perceives the necessity of regulations of natural monopolies and he/she identifies regulation procedures that are important for networks.

Content

The module is concerned with network or infrastructure industries in the economy, e.g. telecommunication, traffic and energy sectors. These sectors are characterized by close interdependencies of operators and users of infrastructure as well as on states. States intervene in various forms, by the public and regulation authorities, due to the importance of network industries and due to limited abilities of markets to work properly in these industries. The students are supposed to develop a broad knowledge of these sectors and of the political options available.

Courses in module *Network Economics* [WI4VWL4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26240	Competition in Networks	2/1	W	5	Mitusch
26206	Regulation	2/0	W	4	Kopp
26234	Regulation Theory and Practice	2/1	S	4	Mitusch
26230	Transport Economics	2/1	W	4	Liedtke, Szimba
26232	Telecommunication and Internet Economics	2/1	W	4	Mitusch

Remarks

This module continues the old module *Network Economics* by Prof. Rothengatter.

Dr. Kopp's lecture *Regulation* [26206] (held for the last time in the WT 09/10) is substituted by the lecture *Regulation Theory and Practice* [26234] by Prof. Mitusch (held for the first time in the ST 10); only one of these lectures can be taken into account. Beginning in the WT 2009/2010, the lecture *Competition in Networks* [26240] will always be held during the winter term.

Module: Environmental Economics**Module key: [WI4VWL5]****Subject:** Economics**Module coordination:** Hariolf Grupp, N.N.**Credit points (CP):** 9**Learning Control / Examinations**

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

Note the changes in course offering under “remarks”.

Prerequisites

Knowledge in the area of microeconomics and of the content of the course *Economics I: Microeconomics* [25012], respectively, is assumed.

Conditions

None.

Learning Outcomes**Content****Courses in module *Environmental Economics* [WI4VWL5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25547	Environmental Economics and Sustainability	2/1	W	5	Walz
25548	Environmental and Ressource Policy	2/1	S	5	Walz
26003	Energy and Environment	2/1	S	5	Karl, n.n.
24140	Environmental Law	2	W	4	Spiecker genannt Döhmann

Module: Economic Policy**Module key: [WI4VWL6]****Subject:** Economics**Module coordination:** Jan Kowalski**Credit points (CP):** 9**Learning Control / Examinations**

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

Note the changes in course offering under “remarks”.

Prerequisites

None.

Conditions

None.

Learning Outcomes

The students

- obtain comprehensive knowledge and competence in various aspects of economic policy
- obtain comprehensive knowledge and competence in issues connected with the European economic integration

Content**Courses in module *Economic Policy* [WI4VWL6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26280	Economic Policy	2/1	S	5	Schaffer
26257	Economic integration in Europe	2	W	4	Kowalski
26272	Economics of Innovation	2/2	W	6	Grupp

Remarks

Module: Allocation and Equilibrium**Module key: [WI4VWL7]****Subject:** Economics**Module coordination:** Clemens Puppe**Credit points (CP):** 9**Learning Control / Examinations**

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

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

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

Prerequisites

Micro- and macroeconomical knowledge corresponding to the content of the economical courses of the Bachelor Programme is assumed.

Conditions

None.

Learning Outcomes**Content****Courses in module *Allocation and Equilibrium* [WI4VWL7]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25527	Advanced Microeconomic Theory	2/1	S	4.5	Puppe
25517	Welfare Economics	2/1	S	4.5	Puppe
25549	Theory of Business Cycles	2/1	W	4.5	Hillebrand

Module: Macroeconomic Theory**Module key: [WI4VWL8]****Subject:** Economics**Module coordination:** Clemens Puppe**Credit points (CP):** 9**Learning Control / Examinations**

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

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

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

Prerequisites

Grundlegende mikro- und makroökonomische Kenntnisse, wie sie beispielsweise in den Veranstaltungen *Volkswirtschaftslehre I (Mikroökonomie)* [25012] und *Volkswirtschaftslehre II (Makroökonomie)* [25014] vermittelt werden, werden vorausgesetzt.

Aufgrund der inhaltlichen Ausrichtung der Veranstaltung wird ein Interesse an quantitativ-mathematischer Modellierung vorausgesetzt.

Conditions

None.

Learning Outcomes**Content****Courses in module *Macroeconomic Theory* [WI4VWL8]**

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

Module: Social Choice Theory**Module key: [WI4VWL9]****Subject:** Economics**Module coordination:** Clemens Puppe**Credit points (CP):** 9**Learning Control / Examinations**

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

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

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

Prerequisites

Micro- and macroeconomical knowledge corresponding to the content of the economical courses of the Bachelor Programme is assumed.

Conditions

None.

Learning Outcomes**Content****Courses in module *Social Choice Theory* [WI4VWL9]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25517	Welfare Economics	2/1	S	4.5	Puppe
25525	Game Theory I	2/2	S	4.5	Berninghaus
25537	Decision Theory and Objectives in Applied Politics	2/1	W	4.5	Tangian
25539	Mathematical Theory of Democracy	2/1	S	4.5	Tangian

5.3 Informatics

Module: Informatics

Module key: [WI4INFO1]

Subject: Informatics

Module coordination: Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Wolfried Stucky, Rudi Studer, Stefan Tai

Credit points (CP): 9

Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites

None.

Conditions

It is only possible to choose a course if the course or a similar one in an other module has not been attended in the Bachelor or Master programme.

One course has to be chosen from the core courses.

Core courses are: *Algorithms for Internet Applications* [25702], *Applied Informatics I - Modelling* [25070], *Applied Informatics II - IT Systems for e-Commerce* [25033], *Complexity Management* [25760], *Database Systems* [25720], *Software Engineering* [25728], *Service-oriented Computing I* [25770] and *Knowledge Management* [25740].

It is only allowed to choose one lab.

Learning Outcomes

The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content

The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Courses in module *Informatics* [WI4INFO1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	Oberweis, Studer, Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	Tai
25760	Complexity Management	2/1	S	5	Seese
25720	Database Systems	2/1	S	5	Oberweis, Dr. D. Sommer
25728	Software Engineering	2/1	W	5	Oberweis, Seese
25770	Service Oriented Computing 1	2/1	W	5	Tai
25740	Knowledge Management	2/1	W	5	Studer
25776	Cloud Computing	2/1	W	5	Tai, Kunze
25724	Database Systems and XML	2/1	W	5	Oberweis
25735	Document Management and Groupware Systems	2	S	4	Klink
25700	Efficient Algorithms	2/1	S	5	Schmeck
25786	Enterprise Architecture Management	2/1	W	5	Wolf
25762	Intelligent Systems in Finance	2/1	S	5	Seese
25764	IT Complexity in Practice	2/1	W	5	Kreidler
25742	Knowledge Discovery	2/1	W	5	Studer
25784	Management of IT-Projects	2/1	S	5	Schätzle
25736	Business Process Modelling	2/1	W	5	Oberweis, Mevius
25706	Nature-inspired Optimisation	2/1	W	5	Mostaghim, Shukla
25704	Organic Computing	2/1	S	5	Schmeck, Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	Kneuper
25748	Semantic Web Technologies I	2/1	W	5	Studer, Rudolph
25750	Semantic Web Technologies II	2/1	S	5	Studer, Agarwal
25772	Service Oriented Computing 2	2/1	S	5	Tai, Studer
25730	Software Technology: Quality Management	2/1	S	5	Oberweis
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	Schmeck
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	Oberweis, Stucky
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	Oberweis, Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	Studer
25788	Strategic Management of Information Technology	2/1	S	5	Wolf
25722	Distributed Database Systems: Basic Technology for e-Business	2/1	S	5	Oberweis
25774	Web Service Engineering	2/1	S	5	Zirpins
25726	Workflow-Management	2/1	S	5	Oberweis
25810	Practical Seminar Knowledge Discovery	2	S	4	Studer
PraBI	Computing Lab Information Systems	2	W/S	4	Oberweis, Seese, Stucky, Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	Seese
25818	Computing Lab in Complexity Management	3	W/S	4	Seese
25820	Lab Class Web Services	2	W	4	Tai, Studer, Satzger, Zirpins
25740p	Exercises in Knowledge Management	3	W/S	4	Studer

Remarks

Module: Emphasis in Informatics**Module key: [WI4INFO2]****Subject:** Informatics**Module coordination:** Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Wolffried Stucky, Rudi Studer, Stefan Tai**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as two 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. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites

The module *Informatics* [WI4INFO1] has to be completed successfully.

Conditions

It is only possible to choose a course if the course or a similar one in an other module has not been attended in the Bachelor or Master programme.

One course has to be chosen from the core courses.

Core courses are: *Algorithms for Internet Applications* [25702], *Applied Informatics I - Modelling* [25070], *Applied Informatics II - IT Systems for e-Commerce* [25033], *Complexity Management* [25760], *Database Systems* [25720], *Service-oriented Computing I* [25770], *Software Engineering* [25728] and *Knowledge Management* [25740].

It is only allowed to choose one lab.

Learning Outcomes

The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content

The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Courses in module *Emphasis in Informatics* [WI4INFO2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	Oberweis, Studer, Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	Tai
25760	Complexity Management	2/1	S	5	Seese
25720	Database Systems	2/1	S	5	Oberweis, Dr. D. Sommer
25770	Service Oriented Computing 1	2/1	W	5	Tai
25728	Software Engineering	2/1	W	5	Oberweis, Seese
25740	Knowledge Management	2/1	W	5	Studer
25724	Database Systems and XML	2/1	W	5	Oberweis
25735	Document Management and Groupware Systems	2	S	4	Klink
25700	Efficient Algorithms	2/1	S	5	Schmeck
25786	Enterprise Architecture Management	2/1	W	5	Wolf
25762	Intelligent Systems in Finance	2/1	S	5	Seese
25764	IT Complexity in Practice	2/1	W	5	Kreidler
25742	Knowledge Discovery	2/1	W	5	Studer
25784	Management of IT-Projects	2/1	S	5	Schätzle
25736	Business Process Modelling	2/1	W	5	Oberweis, Mevius
25706	Nature-inspired Optimisation	2/1	W	5	Mostaghim, Shukla
25704	Organic Computing	2/1	S	5	Schmeck, Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	Kneuper
25748	Semantic Web Technologies I	2/1	W	5	Studer, Rudolph
25750	Semantic Web Technologies II	2/1	S	5	Studer, Agarwal
25772	Service Oriented Computing 2	2/1	S	5	Tai, Studer
25730	Software Technology: Quality Management	2/1	S	5	Oberweis
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	Oberweis, Stucky
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	Schmeck
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	Oberweis, Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	Studer
25788	Strategic Management of Information Technology	2/1	S	5	Wolf
25722	Distributed Database Systems: Basic Technology for e-Business	2/1	S	5	Oberweis
25774	Web Service Engineering	2/1	S	5	Zirpins
25726	Workflow-Management	2/1	S	5	Oberweis
PraBI	Computing Lab Information Systems	2	W/S	4	Oberweis, Seese, Stucky, Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	Seese
25818	Computing Lab in Complexity Management	3	W/S	4	Seese
25810	Practical Seminar Knowledge Discovery	2	S	4	Studer
25820	Lab Class Web Services	2	W	4	Tai, Studer, Satzger, Zirpins
25740p	Exercises in Knowledge Management	3	W/S	4	Studer
25776	Cloud Computing	2/1	W	5	Tai, Kunze

Module: Electives in Informatic**Module key: [WI4INFO3]****Subject:** Informatics**Module coordination:** Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Wolffried Stucky, Rudi Studer, Stefan Tai**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as two 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. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

When every singled examination is passed, the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

Prerequisites

The module *Informatics* [WI4INFO1] has to be completed successfully.

Knowledge of the content of the module *Emphasis in Informatics* [WI4INFO2] is helpful.

Conditions

It is only possible to choose a course if the course or a similar one in an other module has not been attended in the Bachelor or Master programme.

It is only allowed to choose one lab.

Learning Outcomes

The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativeness regarding the methods used,
- knows the principles and methods in the context of their application in practice,
- is able to grasp and apply the rapid developments in the field of computer science, which are encountered in work life, quickly and correctly, based on a fundamental understanding of the concepts and methods of computer science,
- is capable of finding and defending arguments for solving problems.

Content

The thematic focus will be based on the choice of courses in the areas of Effiziente Algorithmen, Betriebliche Informations- und Kommunikationssysteme, Wissensmanagement, Komplexitätsmanagement and Software- und Systems Engineering.

Courses in module *Electives in Informatic* [WI4INFO3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	Oberweis, Studer, Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	Tai
25760	Complexity Management	2/1	S	5	Seese
25720	Database Systems	2/1	S	5	Oberweis, Dr. D. Sommer
25770	Service Oriented Computing 1	2/1	W	5	Tai
25728	Software Engineering	2/1	W	5	Oberweis, Seese
25740	Knowledge Management	2/1	W	5	Studer
25724	Database Systems and XML	2/1	W	5	Oberweis
25735	Document Management and Groupware Systems	2	S	4	Klink
25700	Efficient Algorithms	2/1	S	5	Schmeck
25786	Enterprise Architecture Management	2/1	W	5	Wolf
25762	Intelligent Systems in Finance	2/1	S	5	Seese
25764	IT Complexity in Practice	2/1	W	5	Kreidler
25742	Knowledge Discovery	2/1	W	5	Studer
25784	Management of IT-Projects	2/1	S	5	Schätzle
25736	Business Process Modelling	2/1	W	5	Oberweis, Mevius
25706	Nature-inspired Optimisation	2/1	W	5	Mostaghim, Shukla
25704	Organic Computing	2/1	S	5	Schmeck, Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	Kneuper
25748	Semantic Web Technologies I	2/1	W	5	Studer, Rudolph
25750	Semantic Web Technologies II	2/1	S	5	Studer, Agarwal
25772	Service Oriented Computing 2	2/1	S	5	Tai, Studer
25730	Software Technology: Quality Management	2/1	S	5	Oberweis
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	Oberweis, Stucky
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	Schmeck
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	Oberweis, Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	Studer
25788	Strategic Management of Information Technology	2/1	S	5	Wolf
25722	Distributed Database Systems: Basic Technology for e-Business	2/1	S	5	Oberweis
25774	Web Service Engineering	2/1	S	5	Zirpins
25726	Workflow-Management	2/1	S	5	Oberweis
PraBI	Computing Lab Information Systems	2	W/S	4	Oberweis, Seese, Stucky, Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	Seese
25810	Practical Seminar Knowledge Discovery	2	S	4	Studer
25818	Computing Lab in Complexity Management	3	W/S	4	Seese
25820	Lab Class Web Services	2	W	4	Tai, Studer, Satzger, Zirpins
25740p	Exercises in Knowledge Management	3	W/S	4	Studer
25776	Cloud Computing	2/1	W	5	Tai, Kunze

5.4 Operations Research

Module: Quantitative Marketing and OR

Module key: [WI4OR1]

Subject: Operations Research

Module coordination: Wolfgang Gaul

Credit points (CP): 9

Learning Control / Examinations

The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from the 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

Content

Courses in module *Quantitative Marketing and OR* [WI4OR1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25154	Modern Market Research	2/1	S	4.5	Gaul
25156	Marketing and Operations Research	2/1	S	4.5	Gaul
25158	Corporate Planning and Operations Research	2/1	W	4.5	Gaul
25171	Data Analysis and Operations Research	2/1	W	4.5	Gaul

Module: Operations Research in Supply Chain Management and Health Care Management

Module key: [WI4OR5]

Subject: Operations Research

Module coordination: Stefan Nickel

Credit points (CP): 9

Learning Control / Examinations

The assessment is carried out as partial exams (according to § 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

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

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

Prerequisites

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

Conditions

In agreement with the module coordinator, a course from the modules *Mathematical optimization* [WW4OR6] or *Stochastic Modelling and Optimization* [WW4OR7] or one of the courses *Game Theory I* [25525] and *Game Theory II* [25369] can be acknowledged.

Learning Outcomes

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.

Courses in module [WI4OR5]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25486	Facility Location and Strategic Supply Chain Management	2/1	S	4.5	Nickel
25488	Tactical and Operational Supply Chain Management	2/1	W	4.5	Nickel
n.n.	Operations Research in Supply Chain Management	2/1	S	4.5	Nickel
n.n.	Operations Research in Health Care Management	2/1	S	4.5	Nickel
090428	Enterprise Hospital	2/0	W/S	2	Nickel, Hansis
n.n.	Practical Course: Health Care Management (with Case Studies)	2/1	W/S	7	Nickel
n.n.	Software Laboratory: OR Models II	2/1	S	4.5	Nickel
n.n.	Software Laboratory: Simulation	2/1	S	4.5	Nickel
n.n.	Software Laboratory: SAP APO	2/1	S	4.5	Nickel

Remarks

Some lectures and courses are offered irregularly.

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

Module: Mathematical Programming**Module key: [WI4OR6]****Subject:** Operations Research**Module coordination:** Oliver Stein**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

Upon consultation with the module coordinator, alternatively one lecture from the modules *Operations Research in Supply Chain Management and Health Care Management* [WW4OR5] and *Stochastic Modeling and Optimization* [WW4OR7] or one of the lectures *Game Theory I* [25525] and *Game Theory II* [25369] may be accepted.

Learning Outcomes

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.

Courses in module *Mathematical Programming* [WI4OR6]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25138	Mixed Integer Programming I	2/1	S	4.5	Stein
25140	Mixed Integer Programming II	2/1	W	4.5	Stein
25128	Special Topics in Optimization I	2/1	W/S	4.5	Stein
25126	Special Topics in Optimization II	2/1	W/S	4.5	Stein
n.n.	Location Theory	2/1	W	4.5	Nickel
n.n.	Graph Theory	2/1	W	4.5	Nickel
n.n.	Software Laboratory: OR Models II	2/1	S	4.5	Nickel
25111	Nonlinear Optimization I	2/1	S	4.5	Stein
25113	Nonlinear Optimization II	2/1	S	4.5	Stein
25134	Global Optimization I	2/1	W	4.5	Stein
25136	Global Optimization II	2/1	W	4.5	Stein

Remarks

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

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

Module: Special Topics in Optimization**Module key: [WI4OR7]****Subject:** Operations Research**Module coordination:** Karl-Heinz Waldmann**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 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.

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content**Courses in module *Special Topics in Optimization* [WI4OR7]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25679	Markov Decision Models I	2/1/2	W	4.5	Waldmann
25682	Markov Decision Models II	2/1/2	S	4.5	Waldmann
25674	Quality Control I	2/1/2	W	4.5	Waldmann
25659	Quality Control II	2/1/2	S	4.5	Waldmann
25687	Optimization in a Random Environment	2/1/2	W/S	4.5	Waldmann
25662	Simulation I	2/1/2	W	4.5	Waldmann
25665	Simulation II	2/1/2	S	4.5	Waldmann
n.n.	OR-nahe Modellierung und Analyse realer Probleme (Projekt)	2/1	W/S	4.5	Waldmann

Remarks

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

Module: Optimization in Practice**Module key: [WI4OR2]****Subject:** Operations Research**Module coordination:** Oliver Stein**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Optimization in Practice* [WI4OR2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25111	Non-linear Optimization	4/2/2	S	9	Stein
25134	Global Optimization	4/2/2	W	9	Stein
25138	Mixed-integer Optimization	4/2	S	9	Stein
25128	Combinatorial Optimization	4/2	S	9	N.n.

Remarks

The module was offered in summer term 2009 for the last time.

Module: Stochastic Methods in Economy and Engineering/ Management of Operations

Module key: [WI4OR3]

Subject: Operations Research

Module coordination: Karl-Heinz Waldmann

Credit points (CP): 9

Learning Control / Examinations

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

Topics overview:

Control charts, sampling plans, experimental design.

Reliability theory, maintenance.

Courses in module [WI4OR3]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25674	Quality Control I	2/1/2	W	4.5	Waldmann
25659	Quality Control II	2/1/2	S	4.5	Waldmann
25687	Optimization in a Random Environment	2/1/2	W/S	4.5	Waldmann

Remarks

The lectures of the module are offered irregularly. The curriculum of the next two years is available online.

Module: Stochastic Modelling and Optimization**Module key: [WI4OR4]****Subject:** Operations Research**Module coordination:** Karl-Heinz Waldmann**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

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

Content

Topics overview:

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

Markov decision processes.

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

Game Theory.

Courses in module *Stochastic Modelling and Optimization* [WI4OR4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25662	Simulation I	2/1/2	W	4.5	Waldmann
25665	Simulation II	2/1/2	S	4.5	Waldmann
25369	Game Theory II	2/2	W	4.5	Berninghaus
25679	Markov Decision Models I	2/1/2	W	4.5	Waldmann
25682	Markov Decision Models II	2/1/2	S	4.5	Waldmann

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.

5.5 Statistics

Module: Econometrics and Risk Management in Finance

Module key: [WI4STAT]

Subject: Statistics

Module coordination: Svetlozar Rachev

Credit points (CP): 9

Learning Control / Examinations

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

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

Prerequisites

Profound knowledge in the area of probability theory, estimation theory and test theory is recommended.

Conditions

None.

Learning Outcomes

Content

Courses in module *Econometrics and Risk Management in Finance* [WI4STAT]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25331	Stochastic Calculus and Finance	2/1	W	4,5	Rachev
25353	Statistical Methods in Financial Risk Management	2/1	W	4,5	Rachev
25357	Portfolio and Asset Liability Management	2/1	S	5	Rachev
25359	Financial Time Series and Econometrics	2/1	W	5	Rachev
25381	Advanced Econometrics of Financial Markets	2/1	S	5	Rachev

Module: Mathematical and Empirical Finance**Module key: [WI4STAT1]****Subject:** Statistics**Module coordination:** Svetlozar Rachev**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The lecture *Stochastic Calculus and Finance* [25331] is mandatory.

Learning Outcomes**Content****Courses in module *Mathematical and Empirical Finance* [WI4STAT1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25331	Stochastic Calculus and Finance	2/1	W	4,5	Rachev
25359	Financial Time Series and Econometrics	2/1	W	5	Rachev
25381	Advanced Econometrics of Financial Markets	2/1	S	5	Rachev
25357	Portfolio and Asset Liability Management	2/1	S	5	Rachev
25350/1	Finance and Banking	2/2	W	5	Vollmer
25355	Bank Management and Financial Markets, Applied Econometrics	2/2	S	5	Vollmer

Module: Statistical Methods in Risk Management**Module key: [WI4STAT2]****Subject:** Statistics**Module coordination:** Svetlozar Rachev**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

The lecture *Statistical Methods in Financial Risk Management* [25353] is mandatory.

Learning Outcomes**Content****Courses in module *Statistical Methods in Risk Management* [WI4STAT2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25353	Statistical Methods in Financial Risk Management	2/1	W	4,5	Rachev
25337	Stochastic and Econometric Models in Credit Risk Management	2/2	S	5	Rachev
25357	Portfolio and Asset Liability Management	2/1	S	5	Rachev
25342	Operational Risk and Extreme Value Theory	2/2	W/S	5	Rachev
25375	Data Mining	2	W	5	Nakhaeizadeh
25317	Multivariate Methods	2/2	S	5	Heller

Module: Risk Management and Econometrics in Finance**Module key: [WI4STAT3]****Subject:** Statistics**Module coordination:** Svetlozar Rachev**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Profound knowledge in the area of probability theory, estimation theory and test theory is recommended.

Conditions

None.

Learning Outcomes**Content****Courses in module *Risk Management and Econometrics in Finance* [WI4STAT3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25353	Statistical Methods in Financial Risk Management	2/1	W	4,5	Rachev
25359	Financial Time Series and Econometrics	2/1	W	5	Rachev
25381	Advanced Econometrics of Financial Markets	2/1	S	5	Rachev

5.6 Engineering Sciences

Module: Analysing and Simulation Methods for Mechanical Systems [WI4INGMB19]

Module key:

Subject: Engineering Science

Module coordination: Carsten Proppe

Credit points (CP): 9

Learning Control / Examinations

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

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

Prerequisites

The courses *Engineering Mechanics I* [21208] and *Engineering Mechanics II* [22642] have to be completed successfully.

Conditions

None.

Learning Outcomes

Content

Courses in module *Analysing and Simulation Methods for Mechanical Systems* [WI4INGMB19]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21282	Introduction to the Finite-Element-Method	3/1	S	6	Böhlke
21235	Introduction to Multibody System Dynamics	2	S	3	Seemann
21254	Mathematical Methods in Strength of Materials	2/1	W	4.5	Böhlke
21241	Mathematical Practices in Vibrations	2/1	S	4.5	Wauer
21236	Simulation of Dynamical Systems	2/2	S	6	Proppe
21241p	Practical Training in Measurement of Vibrations	2	W/S	3	Wauer

Module: Selected Topics in Production Technology I**Module key: [WI4INGMB1]****Subject:** Engineering Science**Module coordination:** Volker Schulze**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

It is recommended to attend at least one, at best all three basic courses of production technology in the modules *Production Technology I* [WI3INGMB10], *Production Technology II* [WI3INGMB4], *Production Technology III* [WI3INGMB7].

Learning Outcomes**Content****Courses in module *Selected Topics in Production Technology I* [WI4INGMB1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21657	Manufacturing Technology	4/2	W	9	Schulze
21660	Integrated Production Planning	4/2	S	9	Lanza
21652	Machine Tools	4/2	W	9	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
21669	Materials and Processes in Automotive Light-weight Construction	2	W	4.5	Haepf
21667	Quality Management	2	W	4.5	Lanza
21690	Production system and technology in powertrain production	2	S	4.5	Stauch
21690sem	Seminar Industrial Engineering	2	W/S	4.5	Schulze, Lanza, Munzinger

Module: Selected Topics in Production Technology II**Module key: [WI4INGMB2]****Subject:** Engineering Science**Module coordination:** Volker Schulze**Credit points (CP):** 18**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 grade of the written exam.

Prerequisites

None.

Conditions

It is recommended to attend at least one, at best all three basic courses of production technology in the modules *Production Technology I* [WI3INGMB10], *Production Technology II* [WI3INGMB4], *Production Technology III* [WI3INGMB7].

Learning Outcomes**Content****Courses in module *Selected Topics in Production Technology II* [WI4INGMB2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21657	Manufacturing Technology	4/2	W	9	Schulze
21660	Integrated Production Planning	4/2	S	9	Lanza
21652	Machine Tools	4/2	W	9	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
21669	Materials and Processes in Automotive Light-weight Construction	2	W	4.5	Haepf
21667	Quality Management	2	W	4.5	Lanza
21690	Production system and technology in powertrain production	2	S	4.5	Stauch
21690sem	Seminar Industrial Engineering	2	W/S	4.5	Schulze, Lanza, Munzinger

Module: Selected Topics in Production Technology III**Module key: [WI4INGMB3]****Subject:** Engineering Science**Module coordination:** Volker Schulze**Credit points (CP):** 27**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 grade of the written exam.

Prerequisites

None.

Conditions

It is recommended to attend at least one, at best all three basic courses of production technology in the modules *Production Technology I* [WI3INGMB10], *Production Technology II* [WI3INGMB4], *Production Technology III* [WI3INGMB7].

Learning Outcomes**Content****Courses in module *Selected Topics in Production Technology III* [WI4INGMB3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21657	Manufacturing Technology	4/2	W	9	Schulze
21660	Integrated Production Planning	4/2	S	9	Lanza
21652	Machine Tools	4/2	W	9	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
21669	Materials and Processes in Automotive Light-weight Construction	2	W	4.5	Haepf
21667	Quality Management	2	W	4.5	Lanza
21690	Production system and technology in powertrain production	2	S	4.5	Stauch
21690sem	Seminar Industrial Engineering	2	W/S	4.5	Schulze, Lanza, Munzinger

Module: Introduction to Logistics**Module key: [WI4INGMB20]****Subject:** Engineering Science**Module coordination:** Kai Furmans**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

It is obligatory to choose one of the following courses: *Materialflow* [21051] *Fundamentals of Technical Logistics* [21081] or *Quantitative Risk Management of Logistic Systems* [21075]. Apart from that one additional course has to be chosen from the remaining courses.

Learning Outcomes**Content****Courses in module *Introduction to Logistics* [WI4INGMB20]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21081	Fundamentals of Technical Logistics	3/1	S	6	Mittwollen
21051	Materialflow	3/1	W	6	Furmans
21075	Quantitative Risk Management of Logistic Systems	3/1	S	6	Cardeneo
21083	Informationstechnik für Logistiksysteme	3/1	S	3	Thomas
21086	Warehouse and Distribution Systems	2	S	3	Wisser
21056	Airport Logistics	2	W	3	Brendlin
21061	Safety Engineering	2	W	4	Kany
21064	Industrial Application of Technological Logistics instancing Crane Systems	2	W	3	Golder
21089	Industrial Application of Material Handling Systems in Sorting and Distribution Systems	2	S	3	Föllner
21692	International Production and Logistics	2	S	3	Lanza
21085	Automotive Logistics	2	S	3	Furmans
21074	Informationssysteme in Logistik und Supply Chain Management	2/0	S	3	Kilger

Module: Technical Logistics and Logistic Systems**Module key: [WI4INGMB11]****Subject:** Engineering Science**Module coordination:** Kai Furmans**Credit points (CP):** 18**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.

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL.

Prerequisites

None.

Conditions

It is obligatory to choose two of the following courses: *Logistics* [21078], *Materialflow* [21051], *Fundamentals of Technical Logistics* [21081], *Analytical Models for Material Flow* [21060], *IT for Intralogistics Systems* [21083], *Supply Chain Management* [21062] and *Quantitative Risk Management of Logistic Systems* [21075].

Learning Outcomes**Content****Courses in module *Technical Logistics and Logistic Systems* [WI4INGMB11]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21081	Fundamentals of Technical Logistics	3/1	S	6	Mittwollen
21078	Logistics	3/1	S	6	Furmans
21051	Materialflow	3/1	W	6	Furmans
21060	Analytical Models for Material Flow	3/1	W	6	Furmans
21083	IT for Intralogistics Systems	3/1	S	6	Thomas
21062	Supply Chain Management	3/1	W	6	Alicke
21075	Quantitative Risk Management of Logistic Systems	3/1	S	6	Cardeneo
21086	Warehouse and Distribution Systems	2	S	3	Wisser
21056	Airport Logistics	2	W	3	Brendlin
21085	Automotive Logistics	2	S	3	Furmans
21692	International Production and Logistics	2	S	3	Lanza
21061	Safety Engineering	2	W	4	Kany
21064	Industrial Application of Technological Logistics in- stancing Crane Systems	2	W	3	Golder
21089	Industrial Application of Material Handling Sys- tems in Sorting and Distribution Systems	2	S	3	Föller
21074	Informationssysteme in Logistik und Supply Chain Management	2/0	S	3	Kilger

Module: Handling Characteristics of Motor Vehicles**Module key: [WI4INGMB6]****Subject:** Engineering Science**Module coordination:** Frank Gauterin**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge of the content of the courses *Engineering Mechanics I* [21208], *Engineering Mechanics II* [22642] and *Basics of Automotive Engineering I* [21805], *Basics of Automotive Engineering II* [21835] is helpful.

Conditions

None.

Learning Outcomes

The student

- knows and understands the characteristics of vehicles, owing to the construction and design tokens,
- knows and understands especially the factors being relevant for comfort and acoustics
- is capable of fundamentally evaluating and rating handling characteristics.

Content**Courses in module *Handling Characteristics of Motor Vehicles* [WI4INGMB6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21806	Vehicle Comfort and Acoustics I	2	W	3	Gauterin
21825	Vehicle Comfort and Acoustics II	2	S	3	Gauterin
21807	Handling Characteristics of Motor Vehicles I	2	W	3	Unrau
21838	Handling Characteristics of Motor Vehicles II	2	S	3	Gauterin
21845	Project Workshop-Automotive Engineering	3	W/S	4.5	Gauterin
21816	Vehicle Mechatronics I	2	W	3	Ammon
21850	Driving Dynamics Evaluation within the Global Vehicle Simulation	2/0	S	3	Schick

Module: Vehicle Development**Module key: [WI4INGMB14]****Subject:** Engineering Science**Module coordination:** Frank Gauterin**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge of the content of the courses *Engineering Mechanics I* [21208], *Engineering Mechanics II* [22642] and *Basics of Automotive Engineering I* [21805], *Basics of Automotive Engineering II* [21835] is helpful.

Conditions

None.

Learning Outcomes

The student

- knows and understands the procedures in automobile development,
- knows and understands the technical specifications at the development procedures,
- is aware of notable boundaries like legislation.

Content**Courses in module *Vehicle Development* [WI4INGMB14]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21845	Project Workshop-Automotive Engineering	3	W/S	4.5	Gauterin
21816	Vehicle Mechatronics I	2	W	3	Ammon
21812	Fundamentals in the Development of Commercial Vehicles I	1	W	1.5	Zürn
21844	Fundamentals in the Development of Commercial Vehicles II	1	S	1.5	Zürn
21810	Fundamentals in the Development of Passenger Vehicles I	1	W	1.5	Frech
21842	Fundamentals in the Development of Passenger Vehicles II	1	S	1.5	Frech
21843	Basics and Methods for Integration of Tires and Vehicles	2	S	3	Leister
21095	Simulation of coupled systems	2	S	3	Geimer

Module: Automotive Engineering**Module key: [WI4INGMB5]**

Subject: Engineering Science
Module coordination: Frank Gauterin
Credit points (CP): 9

Learning Control / Examinations

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

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

Prerequisites

Knowledge of the content of the courses *Engineering Mechanics I* [21208], *Engineering Mechanics II* [22642] and *Basics of Automotive Engineering I* [21805], *Basics of Automotive Engineering II* [21835] is helpful.

Conditions

None.

Learning Outcomes

The student

- knows the most important components of a vehicle,
- knows and understands the functioning and the interaction of the individual components,
- knows the basics of dimensioning the components.

Content**Courses in module *Automotive Engineering* [WI4INGMB5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21805	Basics of Automotive Engineering I	4	W	6	Gauterin, Unrau
21835	Basics of Automotive Engineering II	2	S	3	Gauterin, Unrau
21845	Project Workshop-Automotive Engineering	3	W/S	4.5	Gauterin
21814	Fundamentals for Design of Motor-Vehicle Bodies I	1	W	1.5	Bardehle
21840	Fundamentals for Design of Motor-Vehicle Bodies II	1	S	1.5	Bardehle
21093	Fluid Power Systems	2	S	3	Geimer
21092	CAN-Bus Release Control	2	S	3	Geimer

Module: Mobile Machines**Module key: [WI4INGMB15]****Subject:** Engineering Science**Module coordination:** Marcus Geimer**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as a general oral exam (according to Section 4(2), 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 examination is offered every semester. Re-examinations are offered at every ordinary examination date.

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

The assessment may be carried out as partial oral exams (according to Section 4(2), 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. In this case the overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

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

Prerequisites

None.

Conditions

None.

Learning Outcomes

The student

- knows and understands the basic structure of the machines
- masters the basic skills to develop the selected machines

Content

In the module of *Mobile Machines* [WI4INGMB15] the students will learn the structure of the machines and deepen the knowledge of the subject for developing the machines.

After conclusion the module the student will know the latest developments in mobile machines and is able to evaluate the concepts and the trends of developments. The module is practically orientated and supported by industry partners.

Courses in module *Mobile Machines* [WI4INGMB15]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21093	Fluid Power Systems	2	S	3	Geimer
21095	Simulation of coupled systems	2	S	3	Geimer
21092	CAN-Bus Release Control	2	S	3	Geimer
21073	Mobile Machines	4	W	6	Geimer
21812	Fundamentals in the Development of Commercial Vehicles I	1	W	1.5	Zürn
21844	Fundamentals in the Development of Commercial Vehicles II	1	S	1.5	Zürn

Module: Engine Development**Module key: [WI4INGMB17]****Subject:** Engineering Science**Module coordination:** Heiko Kubach**Credit points (CP):** 18**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 weighted average of the grades for each course and truncated after the first decimal.

The weighting factors are:

- *Combustion Engines A* [21101]: 6
- *Combustion Engines B* [21135]: 4
- all the rest: 3

Prerequisites

Knowledge in the area of thermodynamics is helpful.

Conditions

The courses *Combustion Engines A* [21101] and *Combustion Engines B* [21135] are obligatory and have to be attended.

Learning Outcomes**Content****Courses in module *Engine Development* [WI4INGMB17]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21101	Combustion Engines A	4/2	W	8	Spicher
21135	Combustion Engines B	2/1	S	4	Spicher
21112	Supercharging of Internal Combustion Engines	2	S	4	Golloch
21114	Simulation of Spray and Mixture Formation in Internal Combustion Engines	2	W	4	Baumgarten
21134	Methods in Analyzing Internal Combustion	2	S	4	Wagner
21109	Motor Fuels for Combustion Engines and their Verifications	2	W	4	Volz
21138	Internal Combustion Engines and Exhaust Gas Aftertreatment Technology	2	S	4	Lox
21137	Engine Measurement Technologies	2	S	4	Bernhardt

Module: Specific Topics in Material Science**Module key: [WI4INGMB18]****Subject:** Engineering Science**Module coordination:** M. J. Hoffmann**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

Knowledge, comparable to the content of the module *Emphasis Material Science* [WI3INGMB9], is highly recommended.

Natural science basic knowledge is assumed.

Conditions

It is only possible to choose either the course *Physical Basics of Laser Technology* [21612] or the course *Laser Application in Automotive Engineering* [21642].

Learning Outcomes**Content****Courses in module *Specific Topics in Material Science* [WI4INGMB18]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21562s	Failure Analysis	2/2	W	3	Kerscher
21754	Principles of Ceramic and Powder Metallurgy Processing	2	W	3	Oberacker
21775	Structural and Functional Ceramics	2	S	3	Hoffmann
21618	Superhard Thin Film Materials	2	W	3	Ulrich
21612	Physical Basics of Laser Technology	2/1	W	3	Schneider
21642	Laser Application in Automotive Engineering	2	S	3	Schneider
21575	Foundry Technology	2	S	3	Wilhelm
21565/21570	Welding Technology I/II	2	W/S	3	Spies
21560	Experimental Lab Class in Welding Technology, in Groups	3	W	0	Schulze
21751	Practical Course in Engineering Ceramics	2	W	0	Porz
21601	Constitution and Properties of Protective Coatings	2	W	3	Ulrich

Module: Combustion Engines**Module key: [WI4INGMB16]****Subject:** Engineering Science**Module coordination:** Heiko Kubach**Credit points (CP):** 9**Learning Control / Examinations**

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

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

The weighting factors are:

- *Combustion Engines A* [21101]: 6
- *Combustion Engines B* [21135]: 4
- all the rest: 3

Prerequisites

Knowledge in the area of thermodynamics is helpful.

Conditions

The course *Combustion Engines A* [21101] is obligatory.

Learning Outcomes**Content****Courses in module *Combustion Engines* [WI4INGMB16]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21101	Combustion Engines A	4/2	W	8	Spicher
21135	Combustion Engines B	2/1	S	4	Spicher
21137	Engine Measurement Technologies	2	S	4	Bernhardt
21112	Supercharging of Internal Combustion Engines	2	S	4	Golloch
21114	Simulation of Spray and Mixture Formation in Internal Combustion Engines	2	W	4	Baumgarten
21134	Methods in Analyzing Internal Combustion	2	S	4	Wagner
21109	Motor Fuels for Combustion Engines and their Verifications	2	W	4	Volz

Module: Virtual Engineering**Module key: [WI4INGMB22]****Subject:** Engineering Science**Module coordination:** Jivka Ovtcharova**Credit points (CP):** 18**Learning Control / Examinations**

The assessment of the module is carried out by an oral examination about the lectures *Virtual Engineering I und II* and an oral exam (ca. 30 min) about another lecture (according to Section 4(2), 2 of the examination regulation).

The overall grade of the module is the weighted average of the grade of the exam about *Virtual Engineering I und II* (78 percent) and the other exam (22 percent).

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Virtual Engineering* [WI4INGMB22]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21352	Virtual Engineering I	4/3	W	10.5	Ovtcharova
21378	Virtual Engineering II	2/1	S	4.5	
21360	Virtual Engineering for Mechatronic Products	2/0	W	3	Ovtcharova, Rude
21364	Product, Process and Ressource Integration in the Automotive Development	2/1	W/S	4.5	Mbang
21264	Simulation Methods in the Product Creation Process	2/1	W	4.5	Ovtcharova, Albers, Böhlke
21387	Computer Integrated Planning of New Products	2/0	S	3	Kläger

Module: Public Transportation Operations**Module key: [WI4INGBGU4]****Subject:** Engineering Science**Module coordination:** Friedrich Schedel**Credit points (CP):** 9**Learning Control / Examinations**

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

The exams are offered each semester. The re-examinations are offered upon prior agreement with the interested participants and not later than the next regular examination date.

Prerequisites

The module *Foundations of Guided Systems* [WW3INGBGU2] or *Logistics and Management of Guided Systems* [WI4INGBGU7] will be assumed.

Conditions

The courses *Railway Logistics, Management and Operating - Part II* [19321] and *Operating Models in Railway Engineering* [19327] are obligatory and have to be attended.

The course *Construction and Maintenance of Railway Infrastructure* [19307] is not eligible if the module *Guided Systems Engineering* [WI4INGBGU6] is attended at the same time.

Learning Outcomes**Content****Courses in module *Public Transportation Operations* [WI4INGBGU4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19321	Railway Logistics, Management and Operating - Part II	2	S	3	Hohnecker
19327w	Operating Models in Railway Engineering	1	W	1.5	Hohnecker
19327s	Public Transit in Cities and Regions	2	S	3	Hohnecker
19320	Customer Orientation in Public Transport	1	S	1.5	Hohnecker
19307s	Construction and Maintenance of Railway Infrastructure	1	S	1.5	Hohnecker, Müller
19325	Law in Public Transport	1	W	1.5	Hohnecker

Module: Design, Construction, Operation and Maintenance Highways [WI4INGBGU1]

Module key:

Subject: Engineering Science

Module coordination: Ralf Roos

Credit points (CP): 9

Learning Control / Examinations

The assessment of the module consists of a written exam about the lecture *Design Basics in Highway Engineering* [19026] (according to §4(2), 1 of the examination regulation) and a conjoint oral exam about the lectures *Design and Construction Highways* [19065] and *Operation and Maintenance Highways* [19301s].

The exams are offered in each semester and may be resited to any ordinary examination date.

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

Prerequisites

None.

Conditions

The participation in the project Integrated Planning within the branch Highway Engineering or writing a student research paper is obligatory.

The course *Design Basics in Highway Engineering* [19026] is a prerequisite for all other courses of this module.

Learning Outcomes

Content

Courses in module *Design, Construction, Operation and Maintenance Highways* [WI4INGBGU1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19026	Design Basics in Highway Engineering	1/1	S	3	Roos
19065	Design and Construction Highways	1/1	S	3	Roos
19301s	Operation and Maintenance Highways	2	S	3	Roos

Module: Logistics and Management of Guided Systems**Module key: [WI4INGBGU7]****Subject:** Engineering Science**Module coordination:** Friedrich Schedel**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as a general written exam according to §4 Abs. 2, Nr. 1 of the examination regulation. The exam takes place in every semester. The re-examination is offered upon prior agreement with the interested participants and not later than the next regular examination date.

The module grade is the grade for the exam.

Prerequisites

None.

Conditions

The module cannot be chosen if the module *Foundations of Guided Systems* [WW3INGBGU2] of the Bachelor programme has been chosen.

Learning Outcomes**Content****Courses in module *Logistics and Management of Guided Systems* [WI4INGBGU7]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19066	Basics of Ground Born Guided Systems	3/1	S	6	Schedel, Hohnecker
19307w	Station and Rail Transport Facilities	2/1	W	3	Hohnecker

Module: Safety, Computing and Law in Highway Engineering Module key: [WI4INGBGU3]**Subject:** Engineering Science**Module coordination:** Ralf Roos**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out as a general oral exam (according to §4(2), 2 SPO) on the selected courses of the module and a presentation within the *Seminar in Highway Engineering - Mitigation of an accident black spot* [19314]. Single parts of the oral examination is based on the contact hours of each course (1 contact hour = 15 min). The examination will take place on appointment. Re-examinations are offered as needed.

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

Prerequisites

The successful completion of the course *Design Basics in Highway Engineering* [19026] is assumed.

Conditions

None.

Learning Outcomes**Content****Courses in module *Safety, Computing and Law in Highway Engineering* [WI4INGBGU3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19316	EDV in Highway Engineering	1/1	W	3	Zimmermann
19315	Safety Management in Highway Engineering	1	W	2	Zimmermann
19314	Seminar in Highway Engineering - Mitigation of an accident black spot	2	S	1.5	Zimmermann
VLBGU	Laws concerning Traffic and Roads	2	S	3	Kuder

Module: Highway Engineering**Module key: [WI4INGBGU2]****Subject:** Engineering Science**Module coordination:** Ralf Roos**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is a conjoint oral examination (according to §4(2), 2 SPO) on the selected courses of the module. Single parts of the oral examination is based on the contact hours of each course (1 contact hour = 15 min).

The examination will take place on appointment. Resits are offered as needed.

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

Prerequisites

The successful completion of the course *Design Basics in Highway Engineering* [19026] is assumed.

Conditions

The participation in the project Integrated Planning within the branch Highway Engineering or writing a student research paper is obligatory.

Learning Outcomes**Content****Courses in module *Highway Engineering* [WI4INGBGU2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19065	Design and Construction Highways	1/1	S	3	Roos
19301s	Operation and Maintenance Highways	2	S	3	Roos
19302	Environmental Impact of Roads	1	S	1.5	Roos
19303s	Special Topics in Highway Engineering	1	S	1.5	Roos

Module: Guided Systems Engineering**Module key: [WI4INGBGU6]****Subject:** Engineering Science**Module coordination:** Friedrich Schedel**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

The completion of the module *Foundations of Guided Systems* [WW3INGBGU2] or *Logistic and Management of Guided Systems* [WI4INGBGU7] is assumed.

Conditions

The course *Station and Rail Transport Facilities* [19307w] is not eligible if the module *Logistics and Management of Guided Systems* [WI4INGBGU7] is attended at the same time.

The course *Electrical Rail Vehicles* [23346], *Mechanical Models in Railway Engineering* [19322] and *Development and Aspects of Guided Systems* [19326] are obligatory and have to be attended.

Learning Outcomes**Content****Courses in module *Guided Systems Engineering* [WI4INGBGU6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23346	Electrical Rail Vehicles	2	S	3	Clos
19322	Mechanical Models in Railway Engineering	1	S	1.5	Hohnecker
19307s	Construction and Maintenance of Railway Infrastructure	1	S	1.5	Hohnecker, Müller
19307w	Station and Rail Transport Facilities	2/1	W	3	Hohnecker
19308	Freight Transport	1	W	1.5	Chlond
19326	Development and Concept of Track-Led Systems	1	W	1,5	Hohnecker

Module: Environmental Management**Module key: [WI4INGBGU12]****Subject:** Engineering Science**Module coordination:** Erhard Hoffmann**Credit points (CP):** 9**Learning Control / Examinations**

Depending on the choice of courses the assessment of this module is a conjoint oral exam (according to §4(2), 2 of the examination regulation) or written examinations for each course separately (according to §4(2), 1 and 2 of the examination regulation).

- *Analysing and Managing Material Currents in Water Resources Management* [19245]: written exam (40 min)
- all the rest: general oral exam about the chosen courses (60 min.)

A certificate of performance in the *Field Course in Freshwater Ecology* [19243] is required for admission to examination. The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites

Basic knowledge of biology, physics and chemistry taught at the upper secondary level is helpful.

Conditions

The course *Urban Water Resource Management and Ecological Engineering* [19057/19058] is a prerequisite for the *Seminar in Freshwater Ecology* [19057/19058].

The *Seminar in Freshwater Ecology* [19057/19058] is a prerequisite for the *Field Course in Freshwater Ecology* [19243].

The course *Foundations of Bioengineering* [19058] is a prerequisite for the course *Reaction Mechanism in Different Ecosystems* [19241].

Learning Outcomes**Content****Courses in module *Environmental Management* [WI4INGBGU12]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19245	Material Flux Analyses - River Basin Management	2	W	3	Fuchs
19058	Principles of Bioengineering	1/1	S	3	Winter
19241	Reaction Mechanisms in Different Ecosystems	2	S	3	Winter
19260	Legislation of Water, Soil and Waste	2	S	3	Wolf
19246	Environment and Hygiene	1	S	1.5	Würdemann
19057/58	Seminar in Freshwater Ecology	2	S	1.5	Fuchs
19243	Field Course in Freshwater Ecology	2	S	1.5	Fuchs

Module: Project in Public Transportation**Module key: [WI4INGBGU5]****Subject:** Engineering Science**Module coordination:** Friedrich Schedel**Credit points (CP):** 9**Learning Control / Examinations**

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

The exams are offered each semester. The re-examinations are offered upon prior agreement with the interested participants and not later than the next regular examination date.

Prerequisites

The completion of the module *Foundations of Guided Systems* [WW3INGBGU2] or *Logistic and Management of Guided Systems* [WI4INGBGU7] is assumed.

Conditions

The courses *Project in Public Transportation I* [19323] and *Project in Public Transportation II* [19324] are obligatory and have to be attended.

Learning Outcomes**Content****Courses in module *Project in Public Transportation* [WI4INGBGU5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19323	Project in Public Transportation I	4	S	4	Hohnecker
19324	Project in Public Transportation II	2	W	2	Hohnecker
19324	Economics in Public Transport	1	W	1	Hohnecker
19314	Transport Policy	2	W/S	2	Zemlin
19313	Planning and Operation of Public Transport Systems	2	S	2	Weißkopf

Module: Transport Systems**Module key: [WI4INGBGU8]****Subject:** Engineering Science**Module coordination:** Dirk Zumkeller**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of the module is a oral examination (ca. 40 minutes) according to §4(2), 1 of the examination regulation. The assessment takes place at the date fixed.

The overall grade ist the grade of the oral exam.

The module grade can be improved by assessments about complementary courses from the curriculum of the Institute or related disciplines. Overall, a submission of up to 4 credit points is possible. In this case, the overall grade of the module is the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Prerequisites

None.

Conditions

The lecture *Basics in Transport Planning and Traffic Engineering* [19027] has to be chosen in the module.

If the Module *Fundamentals of Spatial and Infrastructural Development* [WW3INGBGU1] was already chosen in the Bachelor programme, the course *Transport Planning Methods* [19301] has to be chosen.

Learning Outcomes**Content****Courses in module *Transport Systems* [WI4INGBGU8]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19027	Basics in Transport Planning and Traffic Engineering	1/1	S	3	Zumkeller, Chlond
19301w	Transport Planning Methods	1/1	W	3	Zumkeller
19062	Transport System Planning	2/1	S	4.5	Zumkeller
19308	Freight Transport	1	W	1.5	Chlond

Module: Transport Ia**Module key: [WI4INGBGU9]****Subject:** Engineering Science**Module coordination:** Dirk Zumkeller**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of the module is a oral examination (ca. 40 minutes) according to §4(2), 1 of the examination regulation. The assessment takes place at the date fixed.

The overall grade ist the grade of the oral exam.

The module grade can be improved by assessments about complementary courses from the curriculum of the Institute or related disciplines. Overall, a submission of up to 4 credit points is possible. In this case, the overall grade of the module is the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Prerequisites

None.

Conditions

It is assumed that the students did not choose the module *Fundamentals of Spatial and Infrastructural Development* [WW3INGBGU1] of the Bachelor programme. In this case the module *Transport Ib* [WI4INGBGU10] has to be chosen.

Learning Outcomes**Content****Courses in module *Transport Ia* [WI4INGBGU9]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19027	Basics in Transport Planning and Traffic Engineering	1/1	S	3	Zumkeller, Chlond
19301w	Transport Planning Methods	1/1	W	3	Zumkeller
19303w	Traffic Engineering and Traffic Telematics	1/1	W	3	Chlond

Module: Transport Ib**Module key: [WI4INGBGU10]****Subject:** Engineering Science**Module coordination:** Dirk Zumkeller**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of the module is a oral examination (ca. 40 minutes) according to §4(2), 1 of the examination regulation. The assessment takes place at the date fixed.

The overall grade ist the grade of the oral exam.

The module grade can be improved by assessments about complementary courses from the curriculum of the Institute or related disciplines. Overall, a submission of up to 4 credit points is possible. In this case, the overall grade of the module is the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Prerequisites

To choose this module the content of the module *Fundamentals of Spatial and Infrastructural Development* [WW3INGBGU1] of the Bachelor programme is a prerequisite. Otherwise it is to choose module *Transport Ia* [WI4INGBGU9].

Conditions

None.

Learning Outcomes**Content****Courses in module *Transport Ib* [WI4INGBGU10]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19301w	Transport Planning Methods	1/1	W	3	Zumkeller
19062	Transport System Planning	2/1	S	4.5	Zumkeller
19303w	Traffic Engineering and Traffic Telematics	1/1	W	3	Chlond

Module: Transport II**Module key: [WI4INGBGU11]****Subject:** Engineering Science**Module coordination:** Dirk Zumkeller**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of the module is a oral examination (ca. 40 minutes) according to §4(2), 1 of the examination regulation. The assessment takes place at the date fixed.

The overall grade ist the grade of the oral exam.

The module grade can be improved by assessments about complementary courses from the curriculum of the Institute or related disciplines. Overall, a submission of up to 4 credit points is possible. In this case, the overall grade of the module is the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Prerequisites

The choice of either the module *Transport Ia* [WI4INGBGU9] or *Transport Ib* [WI4INGBGU10] is a prerequisite.

For the course *Planning and Operation of Public Transport Systems* [19313] the course *Transport* [19027] is assumed.

Conditions

Courses has to be chosen in consultation with the institute so that they match a certain profile (e.g. transport planner, transport engineer, specialist in public transport systems) but have not been part of other modules.

Besides the courses of the Institute of Transport Studies other courses of useful and direct or fact-related disciplines (e.g. urban contruction and spatial planning, highway or railroad engineering) may be chosen.

Therefor the examination schedule has to be composed in accord with the Institut für Verkehrswesen.

Learning Outcomes**Content****Courses in module *Transport II* [WI4INGBGU11]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19308	Freight Transport	1	W	1.5	Chlond
19062	Transport System Planning	2/1	S	4.5	Zumkeller
19313	Planning and Operation of Public Transport Systems	2	S	2	Weißkopf
19305	Simulation Methods for Transport Modelling	1	W	1.5	Schnittger
19309	Application of Simulation Tools	0/1	S	1.5	Hilbertz

Module: Water Supply and Sanitation**Module key: [WI4INGBGU13]****Subject:** Engineering Science**Module coordination:** Erhard Hoffmann**Credit points (CP):** 9**Learning Control / Examinations**

Depending on the choice of courses the assessment of this module is a conjoint oral exam (according to §4(2), 2 of the examination regulation) or written examinations for each course separately (according to §4(2), 1 and 2 of the examination regulation).

- *Urban Water Resource Management and Ecological Engineering* [19057/58]: written exam (40 min)
- all the rest: conjoint oral exam about the chosen courses (60 min.)

A certificate of performance in the *Laboratory - Process Engineering in Water Quality Management* [19054] is required for admission to examination.

The final mark for the module is the average of the marks for each course weighted by the credits of the course.

Prerequisites

Basic knowledge of physics and chemistry taught at the upper secondary level is helpful.

Conditions

None.

Learning Outcomes**Content****Courses in module *Water Supply and Sanitation* [WI4INGBGU13]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19057/58	Urban Water Resource Management and Ecological Engineering	2/1	W	4.5	Fuchs, Winter
19054	Process Engineering in Water Quality Management	2	S	3	Hoffmann
19243/44	Design of Wastewater Treatment Plants and Biosolids Reclaiming Systems (Design of Urban Water and Wastewater Management Systems)	1/1	W	3	Hoffmann
19248	Design and Planning of Urban Drainage Systems	1	S	1.5	Fuchs
19249	Semi- and Decentral Systems	1	S	1.5	Hoffmann, Fuchs
19054	Laboratory - Process Engineering in Water Quality Management	2	S	1.5	Hoffmann
19059	Process Engineering in Waste Management	2	S	3	Winter

Module: Control Engineering I**Module key: [WI4INGETIT1]****Subject:** Engineering Science**Module coordination:** Mathias Kluwe**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

Knowledge about integral transformations is assumed. This knowledge can be acquired in the course *Complex Analysis and Integral Transformations* or via private study (see references of the course *System Dynamics and Control Engineering* [23155]). A proof of performance about this is not necessary.

Conditions

This module cannot be chosen if the module *Control Engineering* [WI3INGETIT2] has been chosen in the Bachelor programme. The course *System Dynamics and Control Engineering* [23155] has to be attended before the course *Optimisation of Dynamic Systems* [23180].

Learning Outcomes

The students

- get familiar with the basic concepts of control theory,
- learn and understand the elements, the structure and the behavior of dynamic systems,
- have insight in the problems of control and intuition about methods available to solve those problems as well in frequency domain as in state space,
- get familiar with the basic principles and methods for the design of optimal controllers for systems.

Content

This module familiarizes students with the basic elements, structures and the behavior of dynamic systems. It gives them insight into the problems of control and intuition about methods available to solve such problems. Both frequency response and state space methods for analysis and design of dynamic systems are considered.

Above that, the students learn the basic principles and methods for the design of optimal controllers for dynamic systems.

Courses in module *Control Engineering I* [WI4INGETIT1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23155	System Dynamics and Control Engineering	3/1	W	6	N.n.
23180	Optimisation of Dynamic Systems	2/1	W	4.5	N.n.

Remarks

Module: Control Engineering II**Module key: [WI4INGETIT2]**

Subject: Engineering Science
Module coordination: Mathias Kluwe
Credit points (CP): 9

Learning Control / Examinations

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

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

Prerequisites

It is only possible to choose this module, if the module *Control Engineering I* [WI4INGETIT1] is attended as well or the module *Control Engineering* [WI3INGETIT2] was chosen in the Bachelor programme. The course *System Dynamics and Control Engineering* [23155] has to be completed successfully beforehand.

Conditions

None.

Learning Outcomes

The students

- have deeper knowledge in the field of control theory and system dynamics,
- are able to analyze time-discrete and multivariable systems and are familiar with adequate methods for the control design,
- know the basics of modelling, simulation, analyses and control of discrete-event and hybrid systems.

Content

This module broadens the basic knowledge of system dynamics of the students to the multivariable case. Both time continuous and time discrete models are considered and methods for the analysis and the control design with different goals (decoupling, robustness) and constraints (disturbances, sensor failures) are presented. Above that, the basics of modelling, simulation, analysis and control of discrete-event and hybrid systems are discussed.

Courses in module *Control Engineering II* [WI4INGETIT2]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23177	Control of Linear Multivariable Systems	3/1	W	6	Kluwe
23160	Automation of Discrete Event and Hybrid Systems	2/0	S	3	Kluwe

Module: Sensor Technology I**Module key: [WI4INGETIT3]****Subject:** Engineering Science**Module coordination:** Wolfgang Menesklou**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

It is recommended to have attended the courses *Electrical Engineering II* [23224] and *Material Science II* [21553] beforehand.

Conditions

The course *Sensor Technology* [23231] is obligatory and has to be attended. The elected courses must not be credited in the module *Sensorik II* [WI4INGETIT5] or other modules.

Before *Experimental Laboratories in Sensors and Actuators* [23232] the course *Sensor Technology* [23231] has to be completed successfully.

Learning Outcomes**Content****Courses in module *Sensor Technology I* [WI4INGETIT3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23231	Sensors	2	W	3	Menesklou
23232	Experimental Laboratories in Sensors and Actuators	4	S	6	Menesklou
23209	Systematic Product Development in Sensor Technology	1/1	W	3	Ivers-Tiffée, Riegel
23240	Integrated Sensor Actuator Systems	2	S	3	Wersing
23233/23234	Seminar: Selected Chapters of Passive Components	2	W/S	3	Menesklou
21881	Micro-Actuators	2	S	3	Kohl

Module: Sensor Technology II**Module key: [WI4INGETIT5]****Subject:** Engineering Science**Module coordination:** Wolfgang Menesklou**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Sensor Technology II* [WI4INGETIT5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23232	Experimental Laboratories in Sensors and Actuators	4	S	6	Menesklou
23209	Systematic Product Development in Sensor Technology	1/1	W	3	Ivers-Tiffée, Riegel
23240	Integrated Sensor Actuator Systems	2	S	3	Wersing
23233/23234	Seminar: Selected Chapters of Passive Components	2	W/S	3	Menesklou
21881	Micro-Actuators	2	S	3	Kohl

Module: Electrical Power Engineering**Module key: [WI4INGETIT4]****Subject:** Engineering Science**Module coordination:** Bernd Hoferer, Thomas Leibfried**Credit points (CP):** 18**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 examinations take place at the beginning of the recess period. 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 weighted average of the grades for each course and truncated after the first decimal.

Prerequisites

None.

Conditions

The course *Electric Power System Engineering II* [23372] is obligatory.

Learning Outcomes

The student

- has wide knowledge of electrical power engineering,
- is capable to analyse and develop electrical power engineering systems.

Content

The module deals with wide knowledge about the electrical power engineering. This ranges from the electric power equipment networks in terms of function, structure and interpretation on the calculation of electrical power networks to special areas such as the FACTS elements or power transformers.

Courses in module *Electrical Power Engineering* [WI4INGETIT4]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23372/23374	Electric Power System Engineering II: Power Transmission and Power Network Control	2/2	S	6	Leibfried
23381	Windpower	2/0	W	3	Lewald
23385	Lectures on HVDC and FACTS – Benefits of Power Electronics for Security and Sustainability of Power Supply	2/0	W	3	Retzmann
23380	Photovoltaic Systems Technology	2/0	S	3	Schmidt
23360/23362	High-Voltage Technology I	2/1	S	4.5	Badent
23361/23363	High-Voltage Technology II	2/1	W	4.5	Badent
23392/23394	High-Voltage Test Technique	2/1	W	4.5	Badent

Module: Fuels, Environment and Global Development**Module key: [WI4INGCV2]****Subject:** Engineering Science**Module coordination:** Georg Schaub**Credit points (CP):** 18**Learning Control / Examinations**

The assessment is carried out as partial assessments (according to §4(2), 1 o. 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

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

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

Prerequisites

It is helpful to have attended courses in the area of chemical engineering and thermodynamics.

Conditions

None.

Learning Outcomes**Content****Courses in module *Fuels, Environment and Global Development* [WI4INGCV2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22305	Fuels I: Fundamentals, Liquid Fuels, Petroleum Processing, Bio Fuels	2/1	W	6	Schaub
22303	Fuels II: Gases and Solids	2/1	S	6	Reimert
22501	Combustion Technology 1 (Basics)	2/1	S	6	Bockhorn
22507	Combustion Related Environmental Protection	2	S	4	Bockhorn
22319	Cycles and Global Development	2/0	W	4	Schaub

Module: Principles of Food Process Engineering**Module key: [WI4INGCV3]****Subject:** Engineering Science**Module coordination:** Volker Gaukel**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out by a general oral exam of the selected courses of this module, whose sum of credits must meet the minimum requirement of credits of this module (according to §4(2), 2 of the examination regulation).

The exam is offered upon agreement with the office of the section Food Process Engineering. Re-examination takes place at least 4 weeks after the last examination date.

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

Prerequisites

None.

Conditions

The courses *Principles of Process Engineering referring to Food I* [22213] and *Principles of Process Engineering referring to Food II* [22214] are obligatory and have to be attended.

It has to be chosen an other course, if *Principles of Process Engineering referring to Food I* [22213] has already been attended in the Bachelor programme.

Learning Outcomes**Content****Courses in module *Principles of Food Process Engineering* [WI4INGCV3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22213	Principles of Process Engineering referring to Food I	2/0	W	4	Gaukel
22214	Principles of Process Engineering referring to Food II	2	S	4	Gaukel
22205	Quality Management of Food Processing	1/1	S	3	Schuchmann
22207	Food Science and Functionality	2	W	3	Watzl

Module: Specialization in Food Process Engineering**Module key: [WI4INGCV4]****Subject:** Engineering Science**Module coordination:** Volker Gaukel**Credit points (CP):** 9**Learning Control / Examinations**

The assessment is carried out by a general oral exam of the selected courses of this module, whose sum of credits must meet the minimum requirement of credits of this module (according to §4(2), 2 of the examination regulation).

The exam is offered upon agreement with the office of the section Food Process Engineering. Re-examination takes place at least 4 weeks after the last examination date.

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

Prerequisites

It is only possible to choose this module in combination with the module *Principles of Food Process Engineering* [WI4INGCV3].

Conditions

The course *Quality Management of Food Processing* [22205] is obligatory and has to be attended. Has it already been attended in the Bachelor programme, another course has to be chosen instead.

Learning Outcomes**Content****Courses in module *Specialization in Food Process Engineering* [WI4INGCV4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22205	Quality Management of Food Processing	1/1	S	3	Schuchmann
22207	Food Science and Functionality	2	W	3	Watzl
22209	Microbiology of Food	2	W	4	Franz
22215	Product Design	2	S	4	Schuchmann
22218	Modern Measurement Techniques for Process Optimization	2	S	4	Regier
22417	Scale up in Biology and Engineering	2	W	4	Hausmann
6602	Fundamentals of Food Chemistry	2	W/S	4	Loske

Module: Water Chemistry**Module key: [WI4INGCV5]****Subject:** Engineering Science**Module coordination:** F.H. Frimmel**Credit points (CP):** 18**Learning Control / Examinations**

The assessment is a general oral exam according to §4 Abs. 2, Nr. 2 of the examination regulation about the chosen courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.

The successful completion of the *Excercises in Water Chemistry* [22664] ist prerequisites for admission to examination.

The exam is offered on appointment, but at least 4 times per year in the first and last week of the summer and winter term.

The overall grade of the module is taken as the average from the individual grades of the oral examination and the grade of the *Excercises* weighted by credit points.

Prerequisites

None.

Conditions

The courses *Chemical Technology of Water* [22601] and *Excercises in Aqueos Chemical Engineering* [22602] are obligatory and have to be attended.

They cannot be attended, if the course *Chemical Technology of Water* [22601] has already been attended in the Bachelor programme.

Learning Outcomes**Content****Courses in module *Water Chemistry* [WI4INGCV5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22601	Chemical Technology of Water	2/0	W	4	Frimmel
22602	Excercises in Aqueos Chemical Engineering	1	W	2	Frimmel
22603	Natural Scientific Basics for Anlysis and Assessment of Aquatic Systems	2	W	4	Frimmel
22618	Fundamentals of Waste Water Treatment	2	S	4	Zwiener
22612	Oxidative Drinking Water Treatment	2	S	4	Frimmel, Zwiener
22611	Sorption-Processes in Water Disinfection	2	S	4	Höll
22605	Water Treatment with Membrane Technology	1	W	2	Frimmel
22664	Excercises in Water Chemistry	2	W	4	Frimmel, Abbt-Braun

Module: Understanding and Prediction of Disasters I**Module key: [WI4INGINTER1]****Subject:** Engineering Science**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

None.

Conditions

'Hydraulic Engineering and Water Ressource Management'[19055] can onle be chosen within this module, if it has not been taken before (e.g., in the modules for bachelor students on Understanding and Prediction of Disasters).

Learning Outcomes**Content****Courses in module *Understanding and Prediction of Disasters I* [WI4INGINTER1]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
04055	Engineering Seismology	3/1	S	5	Wenzel/Sokolov
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	Nestmann et al.
19207	Wasserbauliches Versuchswesen	2/1	S	4.5	Lehmann
19207	River Engineering and Ecology I	2	W	3	Bernhardt/Dister
19213	River Engineering and Ecology II	1/1	S	3	Dister
19203	Morphodynamics of Rivers and Streams	1/1	W	3	Nestmann/Lehmann
19201	Foundations of Hydrological Planning	3/1	W	6	Ihringer
19212	Society, Technics, Ecology	2/1	W	3	Kämpf

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Understanding and Prediction of Disasters II**Module key: [WI4INGINTER2]****Subject:** Engineering Science**Module coordination:** Ute Werner**Credit points (CP):** 18**Learning Control / Examinations****Prerequisites**

None.

Conditions

Hydraulic Engineering and Water Ressource Management'[19055] can onle be chosen within this module, if it has not been taken before (e.g., in the modules for bachelor students on Understanding and Prediction of Disasters).

Learning Outcomes**Content****Courses in module *Understanding and Prediction of Disasters II* [WI4INGINTER2]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
04055	Engineering Seismology	3/1	S	5	Wenzel/Sokolov
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	Nestmann et al.
19207	Wasserbauliches Versuchswesen	2/1	S	4.5	Lehmann
19207	River Engineering and Ecology I	2	W	3	Bernhardt/Dister
19213	River Engineering and Ecology II	1/1	S	3	Dister
19203	Morphodynamics of Rivers and Streams	1/1	W	3	Nestmann/Lehmann
19201	Foundations of Hydrological Planning	3/1	W	6	Ihringer
19212	Society, Technics, Ecology	2/1	W	3	Kämpf

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Understanding and Prediction of Disasters III**Module key: [WI4INGINTER3]****Subject:** Engineering Science**Module coordination:** Ute Werner**Credit points (CP):** 27**Learning Control / Examinations****Prerequisites**

None.

Conditions

Hydraulic Engineering and Water Ressource Management'[19055] can onle be chosen within this module, if it has not been taken before (e.g., in the modules for bachelor students on Understanding and Prediction of Disasters).

Learning Outcomes**Content****Courses in module *Understanding and Prediction of Disasters III* [WI4INGINTER3]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
04055	Engineering Seismology	3/1	S	5	Wenzel/Sokolov
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	Nestmann et al.
19207	Wasserbauliches Versuchswesen	2/1	S	4.5	Lehmann
19207	River Engineering and Ecology I	2	W	3	Bernhardt/Dister
19213	River Engineering and Ecology II	1/1	S	3	Dister
19203	Morphodynamics of Rivers and Streams	1/1	W	3	Nestmann/Lehmann
19201	Foundations of Hydrological Planning	3/1	W	6	Ihringer
19212	Society, Technics, Ecology	2/1	W	3	Kämpf

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Safety Science I**Module key: [WI4INGINTER4]****Subject:** Engineering Science**Module coordination:** Ute Werner**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Safety Science I* [WI4INGINTER4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Exhaust Emissions (VWL), Emissions into the Environment (ING)	2/0	W	3.5	Karl
19523	Contaminated Land Investigation, Evaluation and Remediation	2	W	4	Bieberstein et al.
09031	Design and Construction of Landfills for Municipal and Special Waste	2	W	4	Egloffstein
19621	Assessment of Development Planning	1/1	S	3	Kämpf
19404	Safety in Construction	2	S	1.5	Hirschberger, Sittinger
21562	Failure Analysis	2	W	4	Poser-Keppler
22308	Introduction to Process Safety in the Chemical Industry	2	S	4	Schmidt
21075	Quantitative Risk Management of Logistic Systems	3/1	S	6	Cardeneo

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Safety Science II**Module key: [WI4INGINTER5]**

Subject: Engineering Science
Module coordination: Ute Werner
Credit points (CP): 18

Learning Control / Examinations**Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Safety Science II* [WI4INGINTER5]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Exhaust Emissions (VWL), Emissions into the Environment (ING)	2/0	W	3.5	Karl
19523	Contaminated Land Investigation, Evaluation and Remediation	2	W	4	Bieberstein et al.
09031	Design and Construction of Landfills for Municipal and Special Waste	2	W	4	Egloffstein
19621	Assessment of Development Planning	1/1	S	3	Kämpf
19404	Safety in Construction	2	S	1.5	Hirschberger, Sittinger
21562	Failure Analysis	2	W	4	Poser-Keppler
22308	Introduction to Process Safety in the Chemical Industry	2	S	4	Schmidt
21075	Quantitative Risk Management of Logistic Systems	3/1	S	6	Cardeneo

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Safety Science III**Module key: [WI4INGINTER6]****Subject:** Engineering Science**Module coordination:** Ute Werner**Credit points (CP):** 27**Learning Control / Examinations****Prerequisites**

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Safety Science III* [WI4INGINTER6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Exhaust Emissions (VWL), Emissions into the Environment (ING)	2/0	W	3.5	Karl
19523	Contaminated Land Investigation, Evaluation and Remediation	2	W	4	Bieberstein et al.
09031	Design and Construction of Landfills for Municipal and Special Waste	2	W	4	Egloffstein
19621	Assessment of Development Planning	1/1	S	3	Kämpf
19404	Safety in Construction	2	S	1.5	Hirschberger, Sittinger
21562	Failure Analysis	2	W	4	Poser-Keppler
22308	Introduction to Process Safety in the Chemical Industry	2	S	4	Schmidt
21075	Quantitative Risk Management of Logistic Systems	3/1	S	6	Cardeneo

Remarks

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.

Module: Unscheduled Engineering Module**Module key: [WI4INGAPL]****Subject:** Engineering Science**Module coordination:** Prüfer einer Ingenieurwissenschaftlichen Fakultät**Credit points (CP):** 9**Learning Control / Examinations**

The assessment of the module is determined by the respective module coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points. The examination may contain presentations, experiments, laboratories, term papers, etc. At least 50 percent of the module examination has to be in the form of a written or an oral examination (according to Section 4 (2), 1 or 2 of the examination regulation).

The formation of the overall grade of the module will be determined by the respective module coordinator.

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content**

5.7 Law

Module: Labor and Tax Law

Module key: [WI4JURA1]

Subject: Law

Module coordination: Thomas Dreier

Credit points (CP): 9

Learning Control / Examinations

Prerequisites

Prior knowledge in the area of law totalling at least 9 credit points.

Conditions

Only one module can be chosen from the subjects law and sociology.

Three of the four courses have to be chosen.

Learning Outcomes

Content

Courses in module *Labor and Tax Law* [WI4JURA1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24167	Employment Law I	2	W	3	Hoff
24668	Employment Law II	2	S	3	Hoff
24168	Tax Law I	2/0	W	3	Dietrich
24646	Tax Law II	2/0	S	3	Dietrich

Module: IT-Law**Module key: [WI4JURA2_08]****Subject:** Law**Module coordination:** Thomas Dreier**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

Prior knowledge in the area of law totalling at least 9 credit points.

Conditions

Only one module can be chosen from the subjects law and sociology.

Three of the four courses have to be chosen.

Learning Outcomes**Content****Courses in module *IT-Law* [WI4JURA2_08]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24121	Copyright	2/0	W	3	Dreier
24018	Data Protection Law	2/0	W	3	Spiecker genannt Döhmann
24612	Computer Contract Law	2/0	S	3	Bartsch
24501	Internet Law	2/0	S	3	Dreier

Module: Civil Law**Module key: [WI4JURA3]****Subject:** Law**Module coordination:** Thomas Dreier**Credit points (CP):** 9**Learning Control / Examinations****Prerequisites**

Prior knowledge in the area of law totalling at least 9 credit points.

Conditions

Only one module can be chosen from the subjects law and sociology.

Learning Outcomes**Content****Courses in module *Civil Law* [WI4JURA3]**

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

Module: Commercial Law**Module key: [WI4JURA2]****Subject:** Law**Module coordination:** Peter Sester**Credit points (CP):** 9**Learning Control / Examinations**

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

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Commercial Law* [WI4JURA2]**

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

Module: Intellectual Property Law**Module key: [WI4JURA4]****Subject:** Law**Module coordination:** Thomas Dreier**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

Keine.

Conditions

None.

Learning Outcomes**Content****Courses in module *Intellectual Property Law* [WI4JURA4]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24501	Internet Law	2/0	S	3	Dreier
24121	Copyright	2/0	W	3	Dreier
24661	Patent Law	2/0	S	3	Geissler
24136/24609	Trademark and Unfair Competition Law	2/0	W/S	3	Matz, Sester
24612	Computer Contract Law	2/0	S	3	Bartsch

Module: Private Business Law**Module key: [WI4JURA5]****Subject:** Law**Module coordination:** Peter Sester**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

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.

Conditions

None.

Learning Outcomes**Content****Courses in module *Private Business Law* [WI4JURA5]**

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

Module: Public Business Law**Module key: [WI4JURA6]****Subject:** Law**Module coordination:** Indra Spiecker genannt Döhmann**Credit points (CP):** 9**Learning Control / Examinations**

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

Prerequisites

None.

Conditions

None.

Learning Outcomes**Content****Courses in module *Public Business Law* [WI4JURA6]**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24632	Telecommunications Law	2/0	S	3	Spiecker genannt Döhmann
24082	Public Media Law	2	W	3	Kirchberg
24666	European and International Law	2/0	S	3	Spiecker genannt Döhmann
24140	Environmental Law	2	W	4	Spiecker genannt Döhmann
24018	Data Protection Law	2/0	W	3	Spiecker genannt Döhmann

5.8 Sociology

Module: Sociology

Module key: [WI4SOZ1]

Subject: Sociology

Module coordination: Gerd Nollmann

Credit points (CP): 9

Learning Control / Examinations

Prerequisites

None.

Conditions

None.

Learning Outcomes

Content

Courses in module *Sociology* [WI4SOZ1]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
thSoz	Theoretical Sociology	2	W/S	2	Nollmann, Pfadenhauer, Pfaff, Haupt, Grenz, Eisewicht
spezSoz	Special Sociology	2/0	W/S	4	Nollmann, Pfadenhauer, Pfaff, Haupt, Grenz, Eisewicht, Kunz
SozSem	Projectseminar	2	W/S	4	Bernart, Kunz, Pfaff, Haupt, Grenz, Eisewicht

5.9 General Modules

Module: Seminar Module

Module key: [WW4SEM]

Module coordination: Marliese Uhrig-Homburg, Studiendekan (Fak. f. Wirtschaftswissenschaften)

Credit points (CP): 9

Learning Control / Examinations

The modul examination consists of two seminars with at least 3 credit points each (according to §4 (3), 3 of the examintaion regulation).

Usualy a seminar is completed with the following assessments:

- active participation,
- term paper (workload of at least 80 hrs.) and
- presentation.

Furthermore there has to be completed "key qualification" of at least 3 credit points by one or more course units. These courses can be selected from the course catalogue of the House of Competence (HoC). The exermination performance has to be documented with a grade or at least "with success".

A detailed description of every singled assessment is given in the specific course characerization.

The final mark for the module is the average of the marks for each of the two seminars weighted by the credits and truncated after the first decimal. Grades of the "key qualifications" are not included to the final mark.

Prerequisites

The coursespecific preconditions must be observed.

Conditions

The seminars must be offered by a representative of the School of Economics ande Business Engineering.

Alternatively one of the two compulsory seminars can be asolved at a engineering department or at the Department of Mathematics. The seminar has to be offered by a representantive of the respective departments as well. The assessment has to meet the demands of the School of Economics and Business Engineering (active participation, term paper with a workload of at least 80 h, presentation).

A seminar at another Department then the School of Economics and Business Engineering requires an official approval at all and can be applied at the examination office of the School of Economics and Business Engineering. Seminars at the wbk and the IFL will not requiring these official approval.

Learning Outcomes

The student

- investigates with a selected topic in a special subject,
- analyses and discusses topically issues in the course and within the final term paper,
- discusses, presents und defends subject-specific arguments within the given topic,
- plans and realizes the final term paper mostly autonomous.

Competences which are gained in the seminar module especially prepare the student for composing the final thesis. Within the term paper and the presentation the student exercises himself in scientific working techniques supported by the supervisor.

Beside advancing skills in techniques of scientific working there are gained integrative key qualifications as well. A detailed description o these qualifications is given in the section „Key Qualifications“ of the module handbook.

Content

The module consists of two seminar courses and courses with additional key qualifications.

A detailed list of admitted courses is given in the college catalogue of the Universität Karlsruhe (TH) (<https://zvwgate.zvw.uni-karlsruhe.de/lst/>). More detailed information about the programme of additional key qualifications can be found on <http://www.hoc.kit.edu/sq-wahlbereiche>.

Courses in module *Seminar Module* [WW4SEM]

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
SemAIFB1	Seminar in Enterprise Information Systems	2	W/S	3	Studer, Oberweis, Stucky, Wolf, Kneuper
SemAIFB2	Seminar Efficient Algorithms	2	W/S	3	Schmeck
SemAIFB3	Seminar Complexity Management	2	W/S	3	Seese
SemAIFB4	Seminar Knowledge Management	2	W	3	Studer
26470	Seminar Service Science, Management & Engineering	2	W/S	3	Tai, Weinhardt, Satzger, Studer
25293	Seminar in Finance	2	W/S	3	Uhrig-Homburg, Ruckes
SemFBV1	Seminar in Insurance Management	2	W/S	3	Werner
SemFBV2	Seminar in Operational Risk Management	2	W/S	3	Werner
SemFBV3	Seminar in Risk Theory and Actuarial Science	2	W/S	3	Hipp
25915	Seminar: Management and Organization	2	S	3	Lindstädt
25916	Seminar: Management and Organization	2	W	3	Lindstädt
25195	Master-Seminar Marketing Planning	2	W/S	3	Gaul
25192	Master Seminar in Marketing	2	W/S	3	Gaul
25197	Master-Seminar zum strategischen u. verhaltenswissenschaftlichen Marketing	2	W	3	Neibecker
25194	Master Seminar in Quantitative Marketing and OR	2	W/S	3	Gaul
25193	Master Seminar zu Marktforschung	2	W/S	3	Gaul
25196	Master Seminar in Entrepreneurship, Innovation and International Marketing	2	W/S	3	Gaul
SemIIP	Seminar in Ergonomics	2	W/S	3	Knauth, Karl
SemIIP2	Seminar in Industrial Production	2	W/S	3	Schultmann, Fröhling, Hiete
26510	Master Seminar in Information Engineering and Management	2	W	3	Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	3	Weinhardt
26420	Topics of Sustainable Management of Housing and Real Estate	2	W/S	3	Lützkendorf
SemWIOR4	Seminar in Game and Decision Theory	2	W/S	3	Berninghaus
SemWIOR3	Seminar in Experimental Economics	2	W/S	3	Berninghaus
SemWIOR2	Seminar Economic Theory	2	W/S	3	Puppe
SemIWW	Seminar in System Dynamics and Innovation	2	W/S	3	Grupp, N.N.
SemIWW2	Seminar in International Economy	2/0	W/S	3	Kowalski
26130	Seminar Public Finance	2	W/S	3	Wigger
26263	Seminar on Network Economics	2	W/S	3	Mitusch
25491	Seminar in Discrete Optimization	2	W/S	3	Nickel
25131	Seminar in Continuous Optimization	2	W/S	3	Stein
SemWIOR1	Seminar Stochastic Models	2	W/S	3	Waldmann
SemING	Seminar in Engineering Science	2	W/S	3	Fachvertreter ingenieurwissenschaftlicher Fakultäten
SemMath	Seminar in Mathematics	2	W/S	3	Fachvertreter der Fakultät für Mathematik
HoC1	Elective „Culture - Policy - Science - Technology“	meist 2	W/S	3	House of Competence
HoC2	Elective „Workshops for Competence and Creativity“	meist 2	W/S	3	House of Competence
HoC3	Elective Foreign Languages	2-4	W/S	2-4	House of Competence
HoC4	Elective „Tutor Programmes“	k.A.	W/S	3	House of Competence
HoC5	Elective „Personal Fitness & Emotional Competence“	k.A.	W/S	2-3	House of Competence

Remarks

The listed seminar titles are placeholders. Currently offered seminars of each semester will be published on the websites of the institutes and in the course catalogue of the Universität Karlsruhe (TH). In general, the current seminar topics of each semester are already announced at the end of the previous semester. Furthermore for some seminars there is an application required.

Module: Master Thesis**Module key: [WI4THESIS]****Subject:** nicht kategorisiert**Module coordination:** Der Vorsitzende des Prüfungsausschusses**Credit points (CP):** 30**Learning Control / Examinations**

The Master Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Business Engineering. The Master Thesis is described in detail in § 11 of the examination regulation.

The review is carried out by at least one examiner of the School of Economics and Business Engineering, or, after approval by at least one examiner of another faculty.

The regular processing time takes three months. On a reasoned request of the student, the examination board can extend the processing time of a maximum of one month. If the Master Thesis is not completed in time, this exam is "failed", unless the student is not being responsible (eg maternity leave).

With consent of the examiner the thesis can be written in English as well. Other languages require besides the consent of the examiner the approval of the examination board. The issue of the Master Thesis may only be returned once and only within the first month of processing time. A new topic has to be released within four weeks.

The module grade is the grade for the Master Thesis.

Prerequisites

Prerequisite for admission to the Bachelor thesis is that 50 percent of the credit points has to be completed.

A written confirmation of the examiner about supervising the Bachelor's Thesis is required.

Conditions

Please pay regard to the institute specific rules for supervising a Master Thesis.

The Master Thesis has to contain the following declaration: "I hereby declare that I produced this thesis without external assistance, and that no other than the listed references have been used as sources of information. Passages taken literally or analogously from published or non published sources is marked as this." If this declaration is not given, the Master Thesis will not be accepted.

Learning Outcomes**Content**

The Master Thesis is a major scientific work. The topic of the Master Thesis will be chosen by the student themselves and adjusted with the examiner. The topic has to be related to Business and Engineering and has to refer to subject-specific or interdisciplinary problems.

Prüfungs- und Studienordnung der Universität Karlsruhe (TH) für den Masterstudiengang Wirtschaftsingenieurwesen

Aufgrund von § 34 Absatz 1 Satz 1 des Landeshochschulgesetzes (LHG) vom 1. Januar 2005 hat der Senat der Universität Karlsruhe (TH) am 26.02.2007 die folgende Studien- und Prüfungsordnung für den Masterstudiengang Wirtschaftsingenieurwesen beschlossen.

Der Rektor hat seine Zustimmung am 06.03.2007 erteilt.

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.

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I. Allgemeine Bestimmungen

§ 1 Geltungsbereich, Ziele

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

(2) Im Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft oder ergänzt werden. Der Studierende soll in der Lage sein, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite für die Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bewerten.

§ 2 Akademischer Grad

Aufgrund der bestandenen Masterprüfung wird der akademische Grad „Master of Science“ (abgekürzt: „M.Sc.“) für den Masterstudiengang Wirtschaftsingenieurwesen verliehen.

§ 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

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

(2) Die im Studium zu absolvierenden Lehrinhalte sind auf Fächer verteilt. Die Fächer sind in Module gegliedert, die jeweils aus einer Lehrveranstaltung oder mehreren thematisch und zeitlich aufeinander bezogenen Lehrveranstaltungen bestehen. Studienplan oder Modulhandbuch beschreiben 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 Leistungspunkte sind in der Regel gleichmäßig auf die Semester zu verteilen.

(6) Lehrveranstaltungen/Prüfungen können auch in englischer Sprache angeboten/abgenommen werden.

§ 4 Aufbau der Prüfungen

(1) Die Masterprüfung besteht aus einer Masterarbeit, Fachprüfungen und einem Seminarmodul. Jede der Fachprüfungen besteht aus einer oder mehreren Modulprüfungen. Eine Modulprüfung kann in mehrere Modulteilprüfungen untergliedert sein. Eine Modul(teil)prüfung besteht aus mindestens einer Erfolgskontrolle nach Absatz 2 Nr. 1 und 2. Ausgenommen hiervon sind Seminarmodule.

(2) Erfolgskontrollen sind:

1. schriftliche Prüfungen,
2. mündliche Prüfungen,
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 Modulhandbuch ausgewiesen sind.

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(3) In den Fachprüfungen (nach § 16 Absatz 2 Nr. 1 bis 6) sind mindestens 50 vom Hundert einer Modulprüfung in Form von schriftlichen oder mündlichen Prüfungen (Absatz 2 Nr. 1 und 2) abzulegen, die restliche Prüfung erfolgt durch Erfolgskontrollen anderer Art (Absatz 2 Nr. 3).

§ 5 Anmeldung und Zulassung zu den Prüfungen

(1) Die Zulassung zu den Prüfungen nach § 4 Absatz 2 Nr. 1 und 2 sowie zur Masterarbeit erfolgt im Studienbüro.

Um zu Prüfungen in einem Modul zugelassen zu werden, muss beim Studienbüro eine bindende Erklärung über die Wahl des betreffenden Moduls und dessen Zuordnung zu einem Fach, wenn diese Wahlmöglichkeit besteht, abgegeben werden.

(2) Die Zulassung darf nur abgelehnt werden, wenn der Studierende in einem mit Wirtschaftsingenieurwesen 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 Erfolgskontrollen (§ 4 Absatz 2 Nr. 1 bis 3) eines Moduls wird im Studienplan oder Modulhandbuch in Bezug auf die Lehrinhalte der betreffenden Lehrveranstaltungen und die Lehrziele des Moduls festgelegt. Die Art der Erfolgskontrollen, ihre Häufigkeit, Reihenfolge und Gewichtung, die Grundsätze zur Bildung der Modulteilprüfungsnoten und der Modulnote sowie Prüfer müssen mindestens sechs Wochen vor Semesterbeginn bekannt gegeben werden. Im Einvernehmen von Prüfer und Studierendem kann die Art der Erfolgskontrolle auch nachträglich geändert werden. Dabei ist jedoch § 4 Absatz 3 zu berücksichtigen.

(3) Bei unverhältnismäßig 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.

Bei Einvernehmen zwischen Prüfer und Kandidat kann der Prüfungsausschuss in begründeten Ausnahmefällen auch kurzfristig die Änderung der Prüfungsform genehmigen.

Wird die Wiederholungsprüfung einer schriftlichen Prüfung in mündlicher Form abgelegt, entfällt die mündliche Nachprüfung nach § 8 Absatz 2.

(4) Macht ein Studierender glaubhaft, dass er wegen länger andauernder oder ständiger körperlicher Behinderung nicht in der Lage ist, die Erfolgskontrollen ganz oder teilweise in der vorgeschriebenen Form abzulegen, entscheidet der Prüfungsausschuss über eine alternative Form der Erfolgskontrollen.

(5) Bei Lehrveranstaltungen in englischer Sprache werden die entsprechenden Erfolgskontrollen in der Regel in englischer Sprache abgenommen.

(6) Schriftliche Prüfungen (§ 4 Absatz 2 Nr. 1) sind in der Regel von zwei Prüfern nach § 14 Absatz 2 oder § 14 Absatz 3 zu bewerten. Die Note ergibt sich aus dem arithmetischen Mittel der Einzelbewertungen. Entspricht das arithmetische Mittel keiner der in § 7 Absatz 2 Satz 2 definierten Notenstufen, so ist auf die nächstliegende Notenstufe zu runden. Bei gleichem Abstand ist auf die nächst bessere Notenstufe zu runden. Das Bewertungsverfahren soll sechs Wochen nicht überschreiten. Schriftliche Einzelprüfungen dauern in der Regel mindestens 60 und höchstens 240 Minuten.

(7) Mündliche Prüfungen (§ 4 Absatz 2 Nr. 2) sind von mehreren Prüfern (Kollegialprüfung) oder von einem Prüfer in Gegenwart eines Beisitzenden als Gruppen- oder Einzelprüfungen abzu-

nehmen 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.

(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 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.

(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.

(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 und die Modulteilprüfungen sind zur differenzierten Bewertung nur folgende Noten zugelassen:

1	=	1.0, 1.3	=	sehr gut
2	=	1.7, 2.0, 2.3	=	gut
3	=	2.7, 3.0, 3.3	=	befriedigend
4	=	3.7, 4.0	=	ausreichend
5	=	4.7, 5.0	=	nicht ausreichend

Diese Noten müssen in den Protokollen und in den Anlagen (Transcript of Records und Diploma Supplement) verwendet werden.

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(3) Für Erfolgskontrollen anderer Art kann die Benotung „bestanden“ (passed) oder „nicht bestanden“ (failed) vergeben werden.

(4) Bei der Bildung der gewichteten Durchschnitte der Fachnoten, Modulnoten und der Gesamtnote wird nur die erste Dezimalstelle hinter dem Komma berücksichtigt; alle weiteren Stellen werden ohne Rundung gestrichen.

(5) Jedes Modul, jede Lehrveranstaltung und jede Erfolgskontrolle darf jeweils nur einmal angerechnet werden.

(6) Erfolgskontrollen anderer Art dürfen in Modulteilprüfungen oder Modulprüfungen nur eingerechnet werden, wenn die Benotung nicht nach Absatz 3 erfolgt ist. Die zu dokumentierenden Erfolgskontrollen und die daran geknüpften Bedingungen werden im Studienplan oder Modulhandbuch 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 oder Modulhandbuch geregelt. Die differenzierten Noten der betreffenden Erfolgskontrollen sind bei der Berechnung der Modulnoten als Ausgangsdaten zu verwenden. Enthält der Studienplan oder das Modulhandbuch keine Regelung darüber, wann eine Modulprüfung bestanden ist, so ist diese Modulprüfung dann bestanden, wenn alle dem Modul zugeordneten Modulteilprüfungen bestanden wurden.

(9) Eine Fachprüfung ist bestanden, wenn die für das Fach erforderliche Anzahl von Leistungspunkten über die im Studienplan oder Modulhandbuch definierten Modulprüfungen nachgewiesen wird.

Die Noten der Module eines Faches gehen in die Fachnote mit einem Gewicht proportional zu den ausgewiesenen Leistungspunkten der Module ein.

(10) Die Ergebnisse der Masterarbeit, der Modulprüfungen bzw. der Modulteilprüfungen, der Erfolgskontrollen anderer Art sowie die erworbenen Leistungspunkte werden durch das Studienbüro der Universität erfasst.

(11) Innerhalb der Regelstudienzeit, einschließlich der Urlaubssemester für das Studium an einer ausländischen Hochschule (Regelprüfungszeit), können in einem Fach auch mehr Leistungspunkte erworben werden als für das Bestehen der Fachprüfung erforderlich sind. In diesem Fall werden bei der Festlegung der Fachnote nur die Modulnoten berücksichtigt, die unter Abdeckung der erforderlichen Leistungspunkte die beste Fachnote ergeben.

Die in diesem Sinne für eine Fachprüfung nicht gewerteten Erfolgskontrollen und Leistungspunkte können im Rahmen der Zusatzfachprüfung nach § 12 nachträglich geltend gemacht werden.

(12) Die Gesamtnote der Masterprüfung, die Fachnoten und die Modulnoten lauten:

bis 1,5	=	sehr gut
1.6 bis 2.5	=	gut
2.6 bis 3.5	=	befriedigend
3.6 bis 4.0	=	ausreichend

(13) 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		nicht bestanden (failed) – es sind Verbesserungen erforderlich, bevor die Leistungen anerkannt werden
F		nicht bestanden (failed) – es sind erhebliche Verbesserungen erforderlich

Die Quote ist als der Prozentsatz der erfolgreichen Studierenden definiert, die diese Note in der Regel erhalten. Dabei ist von einer mindestens fünfjährigen Datenbasis über mindestens 30 Studierende auszugehen. Für die Ermittlung der Notenverteilungen, die für die ECTS-Noten erforderlich sind, ist das Studienbüro der Universität zuständig.

§ 8 Erlöschen des Prüfungsanspruchs, Wiederholung von Prüfungen und Erfolgskontrollen

(1) Studierende können eine nicht bestandene schriftliche Prüfung (§ 4 Absatz 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 4.0 (ausreichend) sein.

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

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

(4) Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Absatz 2 Nr. 3) wird im Modulhandbuch 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 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 Satz 3 gilt entsprechend.

Bei nicht bestandener Erfolgskontrolle sind dem Kandidaten Umfang und Frist der Wiederholung in geeigneter Weise bekannt zu machen.

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

(7) Eine Fachprüfung ist nicht bestanden, wenn mindestens ein Modul des Faches 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 Absatz 2 Satz 3 LHG die Masterprüfung bis zum Beginn der Vorlesungszeit des achten Fachsemesters 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.

(10) Der Prüfungsanspruch erlischt endgültig, wenn mindestens einer der folgenden Gründe vorliegt:

1. Der Prüfungsausschuss lehnt einen Antrag auf Fristverlängerung nach Absatz 9 ab.
2. Die Masterarbeit ist endgültig nicht bestanden.
3. Eine Erfolgskontrolle nach § 4 Absatz 2 Nr. 1 und 2 ist in einem Fach endgültig nicht bestanden.
4. Der Prüfungsausschuss hat dem Studierenden nach § 9 Absatz 5 den Prüfungsanspruch entzogen.

Eine Erfolgskontrolle ist dann endgültig nicht bestanden, wenn keine Wiederholungsmöglichkeit im Sinne von Absatz 2 mehr besteht oder gemäß Absatz 5 genehmigt wird. Dies gilt auch sinngemäß für die Masterarbeit.

§ 9 Versäumnis, Rücktritt, Täuschung, Ordnungsverstoß

(1) Der Studierende kann bei Erfolgskontrollen gemäß § 4 Absatz 2 Nr. 1 ohne Angabe von Gründen noch vor Ausgabe der Prüfungsaufgaben zurücktreten. Bei mündlichen Erfolgskontrollen muss der Rücktritt spätestens drei Werktage vor dem betreffenden Prüfungstermin erklärt werden. Die verbindlichen Regelungen zur ordentlichen Abmeldung werden gemäß § 6 Absatz 2 bekannt gegeben. Eine durch Widerruf abgemeldete Prüfung gilt als nicht angemeldet.

(2) Eine Modulprüfung wird mit „nicht ausreichend“ 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 in Zweifelsfällen die Vorlage des Attestes eines vom Prüfungsausschuss benannten Arztes oder 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.

Wird der Grund 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 Erfolgskontrolle durch Täuschung oder Benutzung nicht zugelassener Hilfsmittel zu beeinflussen, gilt die betreffende Erfolgskontrolle als mit „nicht ausreichend“ (5.0) bewertet.

(5) Ein Studierender, der den ordnungsgemäßen Ablauf der Prüfung stört, kann vom jeweiligen Prüfer oder der aufsichtsführenden Person von der Fortsetzung der Modulprüfung ausgeschlossen werden. In diesem Fall wird die betreffende Prüfungsleistung mit „nicht ausreichend“ (5.0) bewertet. In schwerwiegenden Fällen kann der Prüfungsausschuss den Studierenden von der Erbringung weiterer Prüfungsleistungen ausschließen.

(6) Der Studierende kann innerhalb einer Frist von einem Monat verlangen, dass Entscheidungen gemäß Absatz 4 und Absatz 5 vom Prüfungsausschuss überprüft werden. Belastende Entscheidungen des Prüfungsausschusses sind unverzüglich schriftlich mitzuteilen. Sie sind zu begründen und mit einer Rechtsbehelfsbelehrung zu versehen. Vor einer Entscheidung ist Gelegenheit zur Äußerung zu geben.

(7) Näheres regelt die Allgemeine Satzung der Universität Karlsruhe (TH) über die Redlichkeit bei Prüfungen und Praktika.

§ 10 Mutterschutz, Elternzeit

(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 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 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.

§ 11 Masterarbeit

(1) Voraussetzung für die Zulassung zur Masterarbeit ist, dass der Studierende sich in der Regel im 2. Studienjahr befindet und nicht mehr als vier der Fachprüfungen laut § 16 Absatz 2 Nr. 1 bis 6 noch nachzuweisen sind.

Vor Zulassung sind Betreuer, Thema und Anmeldedatum dem Prüfungsausschuss bekannt zu geben und im Falle einer Betreuung außerhalb der Fakultät für Wirtschaftswissenschaften durch den Prüfungsausschuss zu genehmigen.

Auf Antrag des Studierenden sorgt 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) Der Masterarbeit werden 30 Leistungspunkte zugeordnet. Die empfohlene Bearbeitungsdauer beträgt sechs Monate. Die maximale Bearbeitungsdauer beträgt einschließlich einer Verlängerung neun Monate. Die Masterarbeit soll zeigen, dass der Studierende in der Lage ist, ein Problem aus seinem Fach selbstständig und in begrenzter Zeit nach wissenschaftlichen Methoden zu bearbeiten. Sie kann auch in englischer Sprache abgefasst werden.

(4) Die Masterarbeit kann von jedem Prüfer nach § 14 Absatz 2 vergeben und betreut werden. Soll die Masterarbeit außerhalb der Fakultät angefertigt werden, so bedarf dies der Genehmigung des Prüfungsausschusses gemäß Absatz 1. Dem Studierenden ist Gelegenheit zu geben,

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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 3 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 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. Das Thema kann nur einmal und nur innerhalb des ersten Monats der Bearbeitungszeit zurückgegeben werden. Ein neues Thema ist binnen vier Wochen zu stellen und auszugeben. Auf begründeten Antrag des Studierenden kann der Prüfungsausschuss die in Absatz 3 festgelegte Bearbeitungszeit um höchstens drei Monate verlängern. Wird die Masterarbeit nicht fristgerecht abgeliefert, gilt sie als „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 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 Zusatzmodule, Zusatzleistungen

(1) Der Studierende kann sich weiteren Prüfungen in Modulen unterziehen. § 3, § 4 und § 8 Absatz 10 der Prüfungsordnung bleiben davon unberührt.

(2) Maximal zwei Zusatzmodule mit jeweils mindestens neun Leistungspunkten werden auf Antrag des Studierenden in das Masterzeugnis aufgenommen und entsprechend gekennzeichnet.

Zusatzmodule müssen nicht im Studienplan oder Modulhandbuch definiert sein. Im Zweifelsfall entscheidet der Prüfungsausschuss.

Zusatzmodule werden bei der Festsetzung der Gesamtnote nicht mit einbezogen. Alle Zusatzleistungen werden im Transcript of Records automatisch aufgenommen und als Zusatzleistungen gekennzeichnet. Zusatzleistungen werden mit den nach § 7 vorgesehenen Noten gelistet. Diese Zusatzleistungen gehen nicht in die Festsetzung der Gesamt-, Fach- und Modulnoten ein.

(3) Der Studierende hat bereits bei der Anmeldung zu einer Prüfung in einem Modul diese als Zusatzleistung zu deklarieren.

§ 13 Prüfungsausschuss

(1) Für den Masterstudiengang Wirtschaftsingenieurwesen wird ein Prüfungsausschuss gebildet. Er besteht aus fünf stimmberechtigten Mitgliedern: vier Professoren, Juniorprofessoren, Hochschul- oder Privatdozenten, einem Vertreter der Gruppe der wissenschaftlichen Mitarbeiter nach § 10 Absatz 1 Satz 2 Nr. 2 LHG und einem Vertreter der Studierenden mit beratender Stimme. 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 vom Fakultätsrat bestellt, die Mitglieder der Gruppe der wissenschaftlichen Mitarbeiter nach § 10 Absatz 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 sein. Der Vorsitzende des Prüfungsausschusses nimmt die laufenden Geschäfte wahr und wird durch ein Prüfungssekretariat unterstützt.

(3) Der Prüfungsausschuss regelt die Auslegung und die Umsetzung der Prüfungsordnung in die Prüfungspraxis der Fakultät. Er achtet darauf, dass die Bestimmungen der Prüfungsordnung eingehalten werden. Er berichtet regelmäßig dem Fakultätsrat über die Entwicklung der Prüfungen und Studienzeiten sowie über die Verteilung der Fach- und Gesamtnoten und gibt Anregungen zur Reform des Studienplans und der Prüfungsordnung.

(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, an Prüfungen teilzunehmen. 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 hinzuzuziehen. 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 an den Prüfungsausschuss zu richten. Hilft der Prüfungsausschuss dem Widerspruch nicht ab, ist er zur Entscheidung dem für die Lehre zuständigen Mitglied des Rektorats vorzulegen.

§ 14 Prüfer und Beisitzende

(1) Der Prüfungsausschuss bestellt die Prüfer und die Beisitzenden. Er kann die Bestellung dem Vorsitzenden übertragen.

(2) Prüfer sind Hochschullehrer und habilitierte Mitglieder sowie wissenschaftliche 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 Fakultät ihnen eine diesbezügliche Prüfungsbefugnis erteilt hat.

(4) Zum Beisitzenden darf nur bestellt werden, wer einen dem jeweiligen Prüfungsgegenstand entsprechenden akademischen Abschluss erworben hat.

§ 15 Anrechnung von Studienzeiten, Anerkennung von Studienleistungen und Modulprüfungen

(1) Studienzeiten und gleichwertige Studienleistungen und Modulprüfungen, die in gleichen oder anderen Studiengängen an anderen Hochschulen erbracht wurden, werden auf Antrag angerechnet. 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 Studienleistung und Modulprüfung werden die Grundsätze des ECTS herangezogen; die inhaltliche Gleichwertigkeitsprüfung orientiert sich an den Qualifikationszielen des Moduls.

(2) Werden Leistungen angerechnet, so werden die Noten – soweit die Notensysteme vergleichbar sind – übernommen und in die Berechnung der Modulnoten und der Gesamtnote einbezogen. Falls es sich dabei um Leistungen handelt, die im Rahmen eines Auslandsstudiums erbracht werden, während der Studierende an der Universität Karlsruhe (TH) für Wirtschaftsingenieurwesen immatrikuliert ist, kann der Prüfungsausschuss für ausgewählte Sprachen die Dokumentation anerkannter Studienleistungen im Transcript of Records mit ihrer fremdsprachlichen Originalbezeichnung festlegen. Liegen keine Noten vor, wird die Leistung nicht anerkannt. Der Studierende hat die für die Anrechnung erforderlichen Unterlagen vorzulegen.

(3) Bei der Anrechnung von Studienzeiten und der Anerkennung von Studienleistungen und Modulprüfungen, 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, Studienleistungen und Modulprüfungen, die in staatlich anerkannten Fernstudien und an anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufsakademien erworben wurden.

(5) Die Anerkennung von Teilen der Masterprüfung kann versagt werden, wenn in einem Studiengang mehr als die Hälfte aller Erfolgskontrollen und/oder mehr als die Hälfte der erforderlichen Leistungspunkte und/oder die Masterarbeit anerkannt werden sollen.

(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.

II. Masterprüfung

§ 16 Umfang und Art der Masterprüfung

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

(2) Es sind Fachprüfungen im Umfang von neun Modulen mit je neun Leistungspunkten abzulegen. Die Module verteilen sich wie folgt auf die Fächer:

1. Betriebswirtschaftslehre: zwei Module im Umfang von je 9 Leistungspunkten,
2. Volkswirtschaftslehre: ein Modul im Umfang von 9 Leistungspunkten,
3. Informatik: ein Modul im Umfang von 9 Leistungspunkten,
4. Operations Research: ein Modul im Umfang von 9 Leistungspunkten,
5. Ingenieurwissenschaften: zwei Module im Umfang von je 9 Leistungspunkten,
6. Wahlbereich: zwei Module im Umfang von je 9 Leistungspunkten aus den Fächern Betriebswirtschaftslehre, Volkswirtschaftslehre, Informatik, Operations Research, Statistik, Ingenieurwissenschaften, Recht und Soziologie. Auf die Fächer Recht und Soziologie darf dabei in Summe höchstens ein Modul entfallen.

(3) Ferner sind im Rahmen des Seminarmoduls bestehend aus zwei Seminaren mindestens sechs Leistungspunkte nachzuweisen. Neben den hier im Umfang von drei Leistungspunkten vermittelten Schlüsselqualifikationen müssen zusätzliche Schlüsselqualifikationen im Umfang von mindestens drei Leistungspunkten erworben werden.

(4) Die Module, die ihnen zugeordneten Lehrveranstaltungen und Leistungspunkte sowie die Zuordnung der Module zu Fächern sind im Studienplan oder im Modulhandbuch geregelt.

Studienplan oder Modulhandbuch können auch Mehrfachmodule definieren, die aus 18 Leistungspunkten (Doppelmodul) bzw. 27 Leistungspunkten (Dreifachmodul) bestehen und für Fachprüfungen nach 1. bis 6. bei in Summe mindestens gleicher Leistungspunktezahl entsprechend anrechenbar sind. Auch die Mehrfachmodule mit ihren zugeordneten Lehrveranstaltungen, Leistungspunkten und Fächern bzw. Fächerkombinationen sind im Studienplan oder Modulhandbuch geregelt.

(5) Im Studienplan oder Modulhandbuch können darüber hinaus inhaltliche Schwerpunkte definiert werden, denen Module zugeordnet werden können.

Legen die Studierenden ihre Fachprüfungen nach Absatz 2 und 3 in Modulen ab, die nach Art und Umfang den im Studienplan oder Modulhandbuch definierten Anforderungen an diese inhaltlichen Schwerpunkte entsprechen, und wird darüber hinaus die Masterarbeit diesem inhaltlichen Schwerpunkt zugeordnet, so wird der inhaltliche Schwerpunkt auf Antrag des Studierenden in das Diploma Supplement aufgenommen.

§ 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 die Fachprüfungen nach § 16 Absatz 2, das Seminarmodul nach § 16 Absatz 3 und die Masterarbeit nach § 11 mit ihren Leistungspunkten gewichtet.

(3) Hat der Studierende die Masterarbeit mit der Note 1.0 und die Masterprüfung mit einem Durchschnitt von 1.1 oder besser abgeschlossen, so wird das Prädikat „mit Auszeichnung“ (with distinction) verliehen.

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

(1) Über die Masterprüfung wird 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 Masterzeugnis werden in deutscher und englischer Sprache ausgestellt. Masterurkunde und Masterzeugnis tragen das Datum der letzten nachgewiesenen Prüfungsleistung. Sie werden dem Studierenden gleichzeitig ausgehändigt. In der Masterurkunde wird die Verleihung des akademischen Mastergrades beurkundet. Die Masterurkunde wird vom Rektor und vom Dekan unterzeichnet und mit dem Siegel der Universität versehen.

(2) Das Zeugnis enthält die in den Fachprüfungen, den Modulprüfungen sowie dem Seminarmodul und der Masterarbeit erzielten Noten, deren zugeordnete Leistungspunkte und ECTS-Noten und die Gesamtnote und die ihr entsprechende ECTS-Note. Das Zeugnis ist vom Dekan der Fakultät 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) sowie auf Antrag des Studierenden einen möglichen inhaltlichen Schwerpunkt gemäß § 16 Absatz 4.

(4) Die Abschrift der Studiendaten (Transcript of Records) enthält in strukturierter Form alle 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 soll die Zugehörigkeit von Lehrveranstaltungen zu den einzelnen Modulen und die Zugehörigkeit der Module zu den einzelnen Fächern sowie

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bei entsprechendem Antrag des Studierenden zum möglichen inhaltlichen Schwerpunkt gemäß § 16 Absatz 4 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 sowie die zur Prüfung noch fehlenden Prüfungsleistungen enthält und erkennen lässt, dass die Prüfung insgesamt nicht bestanden ist. Dasselbe gilt, wenn der Prüfungsanspruch erloschen ist.

§ 20 Aberkennung des Mastergrades

(1) Hat der Studierende bei einer Prüfungsleistung getäuscht und wird diese Tatsache nach der Aushändigung des Zeugnisses bekannt, so können die Noten der Modulprüfungen, bei denen getäuscht wurde, berichtigt werden. Gegebenenfalls kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(2) Waren die Voraussetzungen für die Zulassung zu einer Prüfung nicht erfüllt, ohne dass der Studierende darüber täuschen wollte, und wird diese Tatsache erst nach Aushändigung des Zeugnisses bekannt, wird dieser Mangel durch das Bestehen der Prüfung geheilt. Hat der Studierende die Zulassung vorsätzlich zu Unrecht erwirkt, so kann die Modulprüfung für „nicht ausreichend“ (5.0) und die Masterprüfung für „nicht bestanden“ erklärt werden.

(3) Vor einer Entscheidung ist Gelegenheit zur Äußerung zu geben.

(4) Das unrichtige Zeugnis ist zu entziehen und gegebenenfalls ein neues zu erteilen. Mit dem unrichtigen Zeugnis ist auch die Masterurkunde einzuziehen, wenn die Masterprüfung auf Grund einer Täuschung für nicht bestanden erklärt wurde.

(5) Eine Entscheidung nach Absatz 1 und Absatz 2 Satz 2 ist nach einer Frist von fünf Jahren ab dem Datum des Zeugnisses ausgeschlossen.

(6) Die Aberkennung des akademischen Grades richtet sich nach den gesetzlichen Vorschriften.

§ 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) Die Einsichtnahme in die schriftlichen Modulprüfungen bzw. Prüfungsprotokolle erfolgt zu einem durch den Prüfer festgelegten, angemessenen Termin innerhalb der Vorlesungszeit. Der Termin ist mit einem Vorlauf von mindestens 14 Tagen anzukündigen und angemessen bekannt zu geben.

(3) Prüfungsunterlagen sind mindestens fünf Jahre aufzubewahren.

§ 22 In-Kraft-Treten

(1) Diese Studien- und Prüfungsordnung tritt am 1. Oktober 2007 in Kraft.

(2) Gleichzeitig tritt die Prüfungsordnung der Universität Karlsruhe (TH) für den Diplomstudiengang Wirtschaftsingenieurwesen vom 15. November 2001 (Amtliche Bekanntmachung der Universität Karlsruhe (TH), Nr. 29 vom 24. November 2001), zuletzt geändert durch Satzung vom 4. Juli 2004 (Amtliche Bekanntmachung der Universität Karlsruhe (TH), Nr. 36 vom 14. Juli 2004) außer Kraft, behält jedoch ihre Gültigkeit bis zum 30. September 2013 für Prüflinge, die auf Grundlage der Prüfungsordnung der Universität Karlsruhe (TH) für den Studiengang Wirtschaftsingenieurwesen vom 15. November 2001 (Amtliche Bekanntmachung der Universität Karlsruhe (TH), Nr. 29 vom 24. November 2001) ihr Studium an der Universität Karlsruhe (TH) aufgenommen haben. Über eine Fristverlängerung darüber hinaus entscheidet der Prüfungsausschuss auf Antrag des Studierenden.

Über einen Antrag an den Prüfungsausschuss können Studierende, die auf Grundlage der Prüfungsordnung der Universität Karlsruhe (TH) für den Studiengang Wirtschaftsingenieurwesen vom 15. November 2001 (Amtliche Bekanntmachung der Universität Karlsruhe (TH), Nr. 29 vom 24. November 2001) ihr Studium an der Universität Karlsruhe (TH) aufgenommen haben, ihr Studium auf Grundlage dieser 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 06.03.2007

*Professor Dr. sc. tech. Horst Hippler
(Rektor)*

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Aufbau des Masterstudiengangs Wirtschaftsingenieurwesen

Die Regelstudienzeit im Masterstudiengang Wirtschaftsingenieurwesen beträgt vier Semester. Im Masterstudium sollen die im Bachelorstudium erworbenen wissenschaftlichen Qualifikationen weiter vertieft oder ergänzt werden. Der Studierende soll in die Lage versetzt werden, die wissenschaftlichen Erkenntnisse und Methoden selbstständig anzuwenden und ihre Bedeutung und Reichweite bei der Lösung komplexer wissenschaftlicher und gesellschaftlicher Problemstellungen zu bearbeiten.

Ferner sind im Rahmen des Seminarmoduls bestehend aus zwei Seminaren mindestens sechs Leistungspunkte nachzuweisen. Neben den hier im Umfang von drei Leistungspunkten vermittelten Schlüsselqualifikationen müssen zusätzliche Schlüsselqualifikationen im Umfang von mindestens drei Leistungspunkten erworben werden.

Die folgende Abbildung zeigt die Fach- und Modulstruktur und die Zuordnung der Leistungspunkte (LP) zu den Fächern. Im Wahlpflichtbereich sind zwei Module aus den Fächern Betriebswirtschaftslehre, Volkswirtschaftslehre, Informatik, Operations Research, Ingenieurwissenschaften, Statistik, Recht und Soziologie zu wählen. Auf die Fächer Recht und Soziologie darf aber in Summe höchstens ein Modul entfallen.

Semester					Summe LP
1.	Modul BWL 9	Modul ING 9	Modul Info 9	Modul Wahlpflicht 9	30
2.	Modul VWL 9	Modul ING 9	Modul OR 9		30
3.	Modul BWL 8	Modul Wahlpflicht 9	Modul Seminare + SQ 6 + 3		30
4.	Masterarbeit 30				30
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