Karlsruhe Institute of Technology

Business Engineering (M.Sc.)

Winter term 2010/2011
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Faculty of Economics and Business Engineering

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Contents

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.

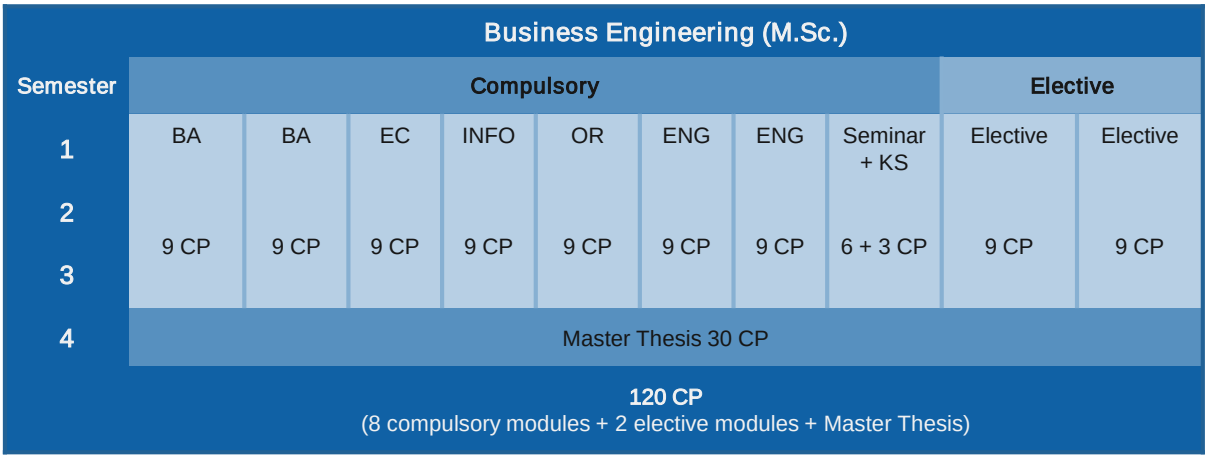

Figure 1: Structure of the Master Programme (Recommendation)

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 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

Orientational 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)

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

Begin and completion of a module

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

General exams and partial exams

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

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

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

Repeating exams

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

Bonus accomplishments and additional accomplishments

Bonus accomplishments can be achieved on the basis of entire modules or within modules, if there are alternatives at choice. Bonus accomplishments can improve the module grade and overall grade by taking into account only the best possible combination of all courses when calculating the grades. The student has to declare a Bonus accomplishment as such at the time of registration for the exams. Exams, which have been registered as Bonus accomplishments, are subject to examination regulations. Therefore, a failed exam has to be repeated. Failing the repeat examination implies the loss of the examination claim.
Additional accomplishments are voluntarily taken exams, which have no impact on the overall grade of the student and can take place on the level of single courses or on entire modules. It is also mandatory to declare an additional accomplishment as such at the time of registration for an exam. Up to 2 modules with a minimum of 9 CP may appear additionally in the certificate. After the approval of the examination committee, it is also possible to include modules in the certificate, which are not defined in the module handbook. Single additional courses will be recorded in the transcript of records. Courses and modules, which have been declared as bonus accomplishments, can be changed to additional accomplishments.

Further information

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

Used abbreviations

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

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.

WI4BWLFBV3 - F2&F3 (Finance) (S. 16)

Anmerkungen

From winter term 2010/11 on the module is not being offered any more. Students can still finish it until winter term 2011/12 or swap to the new module *F3 (Finance)* [WW4BWLFBV11] by written request at the registrar's office.

WI4BWLFBV11 - F3 (Finance) (S. 17)

Anmerkungen

From winter term 2010/11 on this new module replaces the old module *F2&F3 (Finance)* [WW4BWLFBV3].

WI4BWLFBV6 - Insurance Management I (S. 19)

Anmerkungen

The courses *Insurance Marketing* [26323], *Insurance Production* [26324], and *Service Management* [26327] are offered on demand, according to the students' wishes. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The course *Insurance Marketing* [26323] is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.

WI4BWLFBV7 - Insurance Management II (S. 20)

Anmerkungen

The courses *Insurance Marketing* [26323], *Insurance Production* [26324], and *Service Management* [26327] are offered on demand, according to the students' wishes. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The module is offered as an extension module to *Insurance Management I* from summer term 2010 on. Students that already began this module have been assigned to the module *Insurance Management I*.
The course *Insurance Marketing* [26323] is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.

WI4BWLFBV8 - Insurance Statistics (S. 21)

Anmerkungen

The course *Insurance Statistics [26303]* is held by Michael Schrempp in the winter term 2010/11.

WI4BWLFBV9 - Operational Risk Management I (S. 22)

Anmerkungen

The course *Risk Communication* [26395] is offered in the winter term 2010/11 and is held by Dr. Klaus-Jürgen Jeske.
The course *Project Work in Risk Research* [26393] is offered in the winter term 2010/11.
The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in the winter term 2010/11.
The courses *Multidisciplinary Risk Research* [26328], *Risk Communication* [26395], *Risk Management of Microfinance and Private Households* [26354] and *Project Work in Risk Research* [26393] are offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de

WI4BWLFBV10 - Operational Risk Management II (S. 23)

Anmerkungen

The course *Risk Communication* [26395] is offered in the winter term 2010/11 and is held by Dr. Klaus-Jürgen Jeske.
The course *Project Work in Risk Research* [26393] is offered in the winter term 2010/11.
The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in the winter term 2010/11.
The courses *Multidisciplinary Risk Research* [26328], *Risk Communication* [26395], *Risk Management of Microfinance and Private Households* [26354] and *Project Work in Risk Research* [26393] are offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The module is offered as an extension module to *Operational Risk Management I* from summer term 2010 on. Students that already began this module have been assigned to the module *Operational Risk Management I*.

WI4BWLISM7 - Information Engineering (S. 37)

Anmerkungen

The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10. All practical Seminars offered at the IM can be chosen for this course. Please update on the offered seminars on www.iism.kit.edu/im/lehre .

WI4OR6 - Mathematical Programming (S. 65)

Anmerkungen

The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).
For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

WI4INGMB20 - Introduction to Logistics (S. 73)

Anmerkungen

The courses *Technische Logistik I, Grundlagen* [2117081] *and Technische Logistik I, Grundlagen und Systeme* [2117082] are changed in content against the former course *Technische Logistik I* [2117501]. They can be taken alternatively.
All courses with two lecture hours per week have 4 CP.

WI4INGETIT4 - Electrical Power Engineering (S. 102)

Anmerkungen

The course *Lectures on HVDC and FACTS – Benefits of Power Electronics for Security and Sustainability of Power Supply* [23385] is not offered any more. For exams please contact the institute.
The course *High-Voltage Technology I* [23360] is now offered in winter term, *High-Voltage Technology II* [23361] in summer term.

WI4INGCV2 - Fuels, Environment and Global Development (S. 103)

Anmerkungen

The module is not offered any more. It can be completed in winter term 2010/11. Afterwards student have to contact the co-ordinator in order to finish the module.

WI4INGINTER2 - Understanding and Prediction of Disasters II (S. 108)

Anmerkungen

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Understanding and Prediction of Disasters I* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Understanding and Prediction of Disasters I* it is still possible to gain 18 credit points in total in the field of Understanding and Prediction of Disasters.

WI4INGINTER3 - Understanding and Prediction of Disasters III (S. 109)

Anmerkungen

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Understanding and Prediction of Disasters II* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Understanding and Prediction of Disasters I and II* it is still possible to gain 27 credit points in total in the field of Understanding and Prediction of Disasters.

WI4INGINTER5 - Safety Science II (S. 111)

Anmerkungen

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Safety Science I* from winter term 2010/11 on. Students that already began the double module have been assigned to the two single modules.

WI4INGINTER6 - Safety Science III (S. 112)

Anmerkungen

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Safety Science I and II* from winter term 2010/11 on. Students that already began the triple module have been assigned to the three single modules.

WI4INGMB23 - Manufacturing Engineering (S. 115)

Anmerkungen

New module in winter term 2010/11.

WI4INGMB24 - Integrated Production Planning (S. 116)

Anmerkungen

New module in winter term 2010/11.

WI4INGMB22 - Specialization in Production Engineering (S. 117)

Anmerkungen

New module in winter term 2010/11.

WW4INGMB25 - Material Flow in Logistic Systems (S. 118)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WW4INGMB11].

WW4INGMB26 - Material Flow in networked Logistics Systems (S. 119)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WW4INGMB11].

WW4INGMB27 - Technical Logistics (S. 120)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WW4INGMB11].

WW4INGMB28 - Logistics in Value Chain Networks (S. 121)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WW4INGMB11].

WW4INGMB29 - Virtual Engineering A (S. 122)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Virtual Engineering* [WW4INGMB22].

WW4INGMB30 - Virtual Engineering B (S. 123)

Anmerkungen

The module is first offered in winter term 2010/11 and replaces parts of *Virtual Engineering* [WW4INGMB22].

WI4INGMB31 - Global Production and Logistics (S. 124)

Anmerkungen

New module in winter term 2010/11.

5 Modules

5.1 Business Administration

Module: F1 (Finance) [WI4BWLFBV1]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
None.

Learning Outcomes
The student

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

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

Module: F2 (Finance) [WI4BWLFBV2]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
It is only possible to choose this module in combination with the module *F1 (Finance)* [WI4BWLFBV1]. The module is passed only after the final partial exam of *F1 (Finance)*is additionally passed.
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.

Module: F2&F3 (Finance) [WI4BWLFBV3]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
18	Every term	1

Courses in module

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

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

Conditions
It is obligatory to attend the module *F1 (Finance)* [EE4BWLFBV1].
It is not allowed to choose also the module *F2 (Finance)* [WI4BWLFBV2].
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.

Remarks
From winter term 2010/11 on the module is not being offered any more. Students can still finish it until winter term 2011/12 or swap to the new module *F3 (Finance)* [WI4BWLFBV11] by written request at the registrar's office.

Module: F3 (Finance) [WI4BWLFBV11]

Coordination: Marliese Uhrig-Homburg, Martin E. Ruckes
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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

Conditions
It is only possible to choose this module in combination with the module *F1 (Finance)* [WI4BWLFBV1] and *F2 (Finance)* [WI4BWLFBV2]. The module is passed only after the final partial exams of *F2 and F3 (Finance)* are additionally passed.
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] or *F2 (Finance)* [WI4BWLFBV2] 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.

Remarks
From winter term 2010/11 on this new module replaces the old module *F2&F3 (Finance)* [WI4BWLFBV3].

Module: Applications of Actuarial Sciences I (BWL) [WI4BWLFBV4]

Coordination: Christian Hipp
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

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

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

Learning Outcomes

Content

Module: Insurance Management I [WI4BWLFBV6]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26323	Insurance Marketing	3/0	W/S	4.5	U. Werner
26320	Insurance Accounting	3/0	W	4.5	F. Ludwig
26324	Insurance Production	3/0	W/S	4.5	U. Werner
26327	Service Management	3/0	W/S	4.5	U. Werner
25050	Private and Social Insurance	2/0	W	2.5	W. Heilmann, Besserer
26350	Current Issues in the Insurance Industry	2/0	S	2.5	W. Heilmann
26335	Insurance Risk Management	2/0	S	2.5	H. Maser

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

Conditions
It is only possible to choose the courses *Private and Social Insurance* [25050], *Current Issues in the Insurance Industry* [26350], and *Insurance Marketing* [26323] if they were not attended in the Bachelor programme.

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

Learning Outcomes
See German version.

Content
See German version.

Remarks
The courses *Insurance Marketing* [26323], *Insurance Production* [26324], and *Service Management* [26327] are offered on demand, according to the students' wishes. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The course *Insurance Marketing* [26323] is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.

Module: Insurance Management II [WI4BWLFBV7]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26323	Insurance Marketing	3/0	W/S	4.5	U. Werner
26320	Insurance Accounting	3/0	W	4.5	F. Ludwig
26324	Insurance Production	3/0	W/S	4.5	U. Werner
26327	Service Management	3/0	W/S	4.5	U. Werner
25050	Private and Social Insurance	2/0	W	2.5	W. Heilmann, Besserer
26350	Current Issues in the Insurance Industry	2/0	S	2.5	W. Heilmann
26335	Insurance Risk Management	2/0	S	2.5	H. Maser

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

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

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

Learning Outcomes
See German version.

Content
See German version.

Remarks
The courses *Insurance Marketing* [26323], *Insurance Production* [26324], and *Service Management* [26327] are offered on demand, according to the students' wishes. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The module is offered as an extension module to *Insurance Management I* from summer term 2010 on. Students that already began this module have been assigned to the module *Insurance Management I*.
The course *Insurance Marketing* [26323] is offered in the winter term 2010/11 and is held by Dr. Edmund Schwake.

Module: Insurance Statistics [WI4BWLFBV8]

Coordination: Christian Hipp
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

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

Courses in module

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

Learning Control / Examinations

Conditions
None.

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

Learning Outcomes

Content

Remarks
The course *Insurance Statistics [26303]* is held by Michael Schrempp in the winter term 2010/11.

Module: Operational Risk Management I [WI4BWLFBV9]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26326	Enterprise Risk Management	3/0	W	4.5	U. Werner
26328	Multidisciplinary Risk Research	3/0	W/S	4.5	U. Werner
26353	International Risk Transfer	2/0	S	2.5	W. Schwehr
26395	Risk Communication	3/0	W/S	4.5	U. Werner
26354	Risk Management of Microfinance and Private Households	3/0	W/S	4.5	U. Werner
26393	Project Work in Risk Research	3	W/S	4.5	U. Werner

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

Conditions
It is only possible to choose the course *Enterprise Risk Management* [26326] if it was not attended in the Bachelor programme.
It is only possible to choose the course *International Risk Transfer* [26353] 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].

Recommendations
Interest in interdisciplinary research is assumed.

Learning Outcomes
See German version.

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

Remarks
The course *Risk Communication* [26395] is offered in the winter term 2010/11 and is held by Dr. Klaus-Jürgen Jeske.
The course *Project Work in Risk Research* [26393] is offered in the winter term 2010/11.
The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in the winter term 2010/11.
The courses *Multidisciplinary Risk Research* [26328], *Risk Communication* [26395], *Risk Management of Microfinance and Private Households* [26354] and *Project Work in Risk Research* [26393] are offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de

Module: Operational Risk Management II [WI4BWLFBV10]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26326	Enterprise Risk Management	3/0	W	4.5	U. Werner
26328	Multidisciplinary Risk Research	3/0	W/S	4.5	U. Werner
26353	International Risk Transfer	2/0	S	2.5	W. Schwehr
26395	Risk Communication	3/0	W/S	4.5	U. Werner
26354	Risk Management of Microfinance and Private Households	3/0	W/S	4.5	U. Werner
26393	Project Work in Risk Research	3	W/S	4.5	U. Werner

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

Conditions
It is only possible to choose this module in combination with the module *Operational Risk Management I* [WI4BWLFBV9]. The module is passed only after the final partial exam of *Operational Risk Management I* is additionally passed.

Recommendations
Interest in interdisciplinary research is assumed.

Learning Outcomes
See German version.

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

Remarks
The course *Risk Communication* [26395] is offered in the winter term 2010/11 and is held by Dr. Klaus-Jürgen Jeske.
The course *Project Work in Risk Research* [26393] is offered in the winter term 2010/11.
The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in the winter term 2010/11.
The courses *Multidisciplinary Risk Research* [26328], *Risk Communication* [26395], *Risk Management of Microfinance and Private Households* [26354] and *Project Work in Risk Research* [26393] are offered irregularly. For further information, see: http://insurance.fbv.uni-karlsruhe.de
The module is offered as an extension module to *Operational Risk Management I* from summer term 2010 on. Students that already began this module have been assigned to the module *Operational Risk Management I*.

Module: Entrepreneurship, Innovation and International Marketing [WI4BWLMAR6]

Coordination: Wolfgang Gaul
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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 lecutres and influence the final grade positively.

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

Module: Marketing Planning [WI4BWLMAR1]

Coordination: Wolfgang Gaul
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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 lecutres and influence the final grade positively.

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

Learning Outcomes

Content

Module: Market Research [WI4BWLMAR2]

Coordination: Wolfgang Gaul
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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 lecutres and influence the final grade positively.

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

Learning Outcomes

Content

Module: Strategy, Innovation and Data Analysis [WI4BWLMAR3]

Coordination: Bruno Neibecker
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

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

Courses in module

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

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.

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 indentify the main research trends
- To analyze and interpret high level academic articles
- To learn interactive skills to work in teams and to follow a goal-oriented approach
- To gain understanding of methodological research to develop concrete plans for marketing decision-making

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

Module: Behavioral Approaches in Marketing and Data Analysis [WI4BWLMAR4]

Coordination: Bruno Neibecker
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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.

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 conprehensive understanding of marketing research and marketing data analysis is provided throughout the module, as for example in market segmentation or the definition of a target market a company decides to pursue.

Module: Strategic Corporate Management and Organization [WI4BWLUO1]

Coordination: Hagen Lindstädt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25904	Organization Theory	2/1	W	6	H. Lindstädt
25902	Managing Organizations	2/0	W	4	H. Lindstädt
25908	Modeling Strategic Decision Making	2/1	S	6	H. Lindstädt
25900	Management and Strategy	2/0	S	4	H. Lindstädt

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

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

Learning Outcomes

Content

Remarks
See German version.

Module: Strategic Decision Making and Organization Theory [WI4BWLUO3]

Coordination: Hagen Lindstädt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25904	Organization Theory	2/1	W	6	H. Lindstädt
25908	Modeling Strategic Decision Making	2/1	S	6	H. Lindstädt
26127	Public Management	2/1	W	6	B. Wigger, Assistenten

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

Conditions
None.

Learning Outcomes

Content

Module: Advanced CRM [WI4BWLISM1]

Coordination: Andreas Geyer-Schulz
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26508	Customer Relationship Management	2/1	W	4.5	A. Geyer-Schulz
26506	Personalization and Recommender Systems	2/1	S	4.5	A. Geyer-Schulz
26518	Social Network Analysis in CRM	2/1	W/S	4,5	B. Hoser
26531	Business Dynamics	2/1	S	4.5	A. Neumann

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

Conditions
None.

Learning Outcomes
The student

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

Content
Besides the foundations of modern customer oriented and service oriented management, developments of CRM systems are lectured together with tools for analysis and optimization of such systems.
An overview of general aspects and concepts of personalization and their importance for service provider and customers is given. Then, different categories of recommendation systems are presented: Ranging from explizit recommendation services like reviews to implicit services like the calcuation of recommendations based on the historic data about products and/or customers.
There exist a trend towards viewing economic systems and social systems as networks. This approach allows for the application of different methods from mathematics, economic sciences, sociology and physics. In CRM, net work analyses may provide benefits calculating customer network values.
CRM processes and marketing campaigns are just two examples of dynamic systems that are characterized by feedback loops between different process steps. By means of the tools of business dynamics such processes can be modelled. Simulations of complex systems allow the analysis and optimization of business processes, marketing campaigns, and organizations.

Module: Electronic Markets [WI4BWLISM2]

Coordination: Andreas Geyer-Schulz
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26502	Electronic Markets (Principles)	2/1	W	4.5	A. Geyer-Schulz
26460	Market Engineering: Information in Institutions	2/1	S	4,5	C. Weinhardt, J. Kraemer, C. van Dinther, S. Caton
26232	Telecommunication and Internet Economics	2/1	W	4,5	K. Mitusch
26531	Business Dynamics	2/1	S	4.5	A. Neumann

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

Conditions
None.

Learning Outcomes
The student

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

Content
What are the conditions that make electronic markets develop and how can one analyse and optimize such markets?
In this module, the selection of the type of organization as an optimization of transaction costs is treated. Afterwards, the efficiency of electronic markets (price, information and allocation efficiency) as well as reasons for market failure are described. Finally, motivational issues llike bounded rationality and information assymetries (private information and moral hazard), as well as the development of incentive schemes, are presented. Regarding the market design, especially the interdependencies of market organization, market mechanisms, institutions and products are described and theoretical foundations are lectured.
Electronic markets are dynamic systems that are characterized by feedback loops between many different variables. By means of the tools of business dynamics such markets can be modelled. Simulations of complex systems allow the analysis and optimization of markets, business processes, policies, and organizations.
Topics include:

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

Module: Market Engineering [WI4BWLISM3]

Coordination: Christof Weinhardt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
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.

Remarks
The lecture Comptuational Economics was also changed to 4.5 credit points for Computer Science students starting from the winter term 2010/11.

Module: Business & Service Engineering [WI4BWLISM4]

Coordination: Christof Weinhardt, Gerhard Satzger
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
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.

Module: Communications & Markets [WI4BWLISM5]

Coordination: Christof Weinhardt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
The course *Communications Economics* [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 postion, which can change the situation in a market. These changes inflict a change in corporate policy. Approaches from game-theory in industrial economics and mechanism design are offering analytic tools by which one can systematically deduce strategic decisions for businesses, given a certain market situation.

Remarks
The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10. All practical Seminars offered at the IM can be chosen for this course. Please update yourself on www.iism.kit.edu/im/lehre .

Module: Service Management [WI4BWLISM6]

Coordination: Gerhard Satzger, Christof Weinhardt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
The course *Business and IT Service Management* [26484] is obligatory.
The course *eServices* [26466] can only be choosen, 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.

Module: Information Engineering [WI4BWLISM7]

Coordination: Christof Weinhardt
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
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 choosen, the course Special Topics in Information Engineering & Management additionally provides an opportunity of practical research in the aforementioned range of subjects.

Remarks
The lecture *Special Topics in Information Engineering & Management* [26478] is first offered in the winter term 2009/10. All practical Seminars offered at the IM can be chosen for this course. Please update on the offered seminars on www.iism.kit.edu/im/lehre .

Module: Industrial Ergonomics [WI4BWLIIP1]

Coordination: Christine Harbring
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25988	Changes in th Working World	2	W/S	3	S. Hornberger
25964	Ergonomics I	2/1	W	3	P. Knauth
25965	Ergonomics II	2/1	S	3	D. Karl
25967	Industrial Studies of Time and Motion	2	W	3	S. Dürrschnabel
25969	Compensation and Motivation	2/1	S	4,5	C. Harbring
25930	Strategic Human Resource Management	2/1	W	4,5	C. Harbring
25932	Performance and Behavior in Organizations	2/1	W	4,5	C. Harbring
25934	Selected Topics in Ergonomics	2	W/S	3	D. Karl

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

Conditions
None.

Learning Outcomes

Content

Module: Industrial Production II [WI4BWLIIP2]

Coordination: Frank Schultmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

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

Courses in module

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

Learning Control / Examinations
The examination will be in form of individual written exams acc. to §4(2), 1 ER, covering the chosen courses which sum up to minimum requirements. Exams are offered in every semester and can be re-examined at every ordinary examination date.
The overall modular grade is calculated by weighing the individual grades with the according credit points. The grade will be truncated after the first decimal. Additional results may be considered on request.

Conditions
The course “Planning and Management of Industrial Plants” [25952] and one additional activity have to be chosen. Each course may only be taken in one module, i.e. no course can be applied to two different modules.

Recommendations
Skills learned in the compulsory B.Sc. modules of business administration, engineering, operations research and informatics.
The courses are set up in a way that they can be taken independently from each other; therefore it is possible to start this module at any time.
We recommend combining this module with “Industrial Production I” [WW3BWLIIP] (Bachelor) and “Industrial Production III” [WI4BWLIIP6] (Master).

Learning Outcomes

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

Content

- Planning and Management of Industrial Plants: Basics, circulation flow starting from projecting to techno-economic evaluation, construction and operating up to plant dismantling.
- Additional courses cover project management principles and discussion of how decisions in an industrial environment (politics, environment protection, etc.) might affect plant design and operation.

Module: Industrial Production III [WI4BWLIIP6]

Coordination: Frank Schultmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25954	Production and Logistics Management	2/2	S	5.5	M. Fröhling, F. Schultmann
25975	Computer-based Production Planning and Control, Process Simulation and Supply Chain Management	2/0	S	2	M. Fröhling, F. Schultmann
25963	The Management of R&D Projects with Case Studies	2/2	W/S	3.5	H. Schmied
25961	Supply Chain Management with Advanced Planning Systems	2	S	2	M. Göbelt, C. Sürie

Learning Control / Examinations
The examination will be in form of individual written exams acc. to §4(2), 1 ER, covering the chosen courses which sum up to minimum requirements. Exams are offered in every semester and can be re-examined at every ordinary examination date.
The overall modular grade is calculated by weighing the individual grades with the according credit points. The grade will be truncated after the first decimal.

Conditions
Skills learned in the compulsory B.Sc. modules of business administration, engineering, operations research and informatics.
The course *Production and Logistics Management* [25954] and one additional activity have to be chosen. Each course may only be taken in one module, i.e. no course can be applied to two different modules.

Recommendations
The courses are set up in a way that they can be taken independently from each other; therefore it is possible to start this module at any time.
We recommend combining this module with “Industrial Production I” [WW3BWLIIP] (Bachelor) and “Industrial Production II” [WI4BWLIIP2] (Master).

Learning Outcomes

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

Content

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

Module: Basics of Liberalised Energy Markets [WI4BWLIIP4]

Coordination: Wolf Fichtner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25998	Basics of Liberalised Energy Markets	2/1	W	3.5	W. Fichtner
26020	Energy Trade and Risk Management	2/1	S	3.5	K. Hufendiek
25959	Energy Policy	2/0	S	3.5	M. Wietschel
26022	Gas-Markets	2/0	W	3	A. Pustisek
26025	Simulation Game in Energy Economics	2/0	W	3	W. Fichtner
26234	Regulation Theory and Practice	2/1	S	4.5	K. Mitusch

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. Additional courses might be accredited upon request.

Conditions
None.

Learning Outcomes

Content

Module: Energy Industry and Technology [WI4BWLIIP5]

Coordination: Wolf Fichtner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26003	Energy and Environment	2/1	S	4,5	U. Karl, n.n.
25958	Strategical Aspects of Energy Economy	2/0	W	3.5	A. Ardone
26000	Technological Change in Energy Industry	2/0	W	3	M. Wietschel
26001	Heat Economy	2/0	S	3	W. Fichtner
26002	Energy Systems Analysis	2/0	S	3	D. Möst

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. Additional courses might be accredited upon request.

Conditions
None.

Learning Outcomes

Content

Module: Leadership / Change Management [WI4BWLIIP3]

Coordination: Christine Harbring
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25972	Human Resource Management I	2	W	3	A. Wollert
25973	Human Resource Management II	2	S	3	A. Wollert
25968	Social Relationships in Organisations	2	S	3	G. Kraus
25969	Development of Personnal and Organisation	2	W	3	J. Weisheit
25969	Compensation and Motivation	2/1	S	4,5	C. Harbring
25930	Strategic Human Resource Management	2/1	W	4,5	C. Harbring
25932	Performance and Behavior in Organizations	2/1	W	4,5	C. Harbring

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

Conditions
None.

Learning Outcomes

Content

Module: Performance and Behavior in Organizations [WI4BWLIAP2]

Coordination: Christine Harbring
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Business Administration

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25969	Compensation and Motivation	2/1	S	4,5	C. Harbring
25930	Strategic Human Resource Management	2/1	W	4,5	C. Harbring
25932	Performance and Behavior in Organizations	2/1	W	4,5	C. Harbring

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

Conditions
The course *Performance and Behavior* must be taken.

Learning Outcomes

Content

5.2 Economics

Module: Applied Strategic Decisions [WI4VWL2]

Coordination: Siegfried Berninghaus, Clemens Puppe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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.

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

Recommendations
The student should have basic knowledge of game theory.

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.

Module: Network Economics [WI4VWL4]

Coordination: Kay Mitusch
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26240	Competition in Networks	2/1	W	4.5	K. Mitusch
26234	Regulation Theory and Practice	2/1	S	4.5	K. Mitusch
26230	Transport Economics	2/1	S	4.5	G. Liedtke, E. Szimba
26232	Telecommunication and Internet Economics	2/1	W	4,5	K. Mitusch
25527	Advanced Topics in Economic Theory	2/1	S	4.5	C. Puppe, M. Hillebrand, K. Mitusch

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1 or 2 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module.
The exams are offered at the beginning of the recess period about the subject matter of the latest held lecture. Re-examinations are offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
Note the changes in course offering under "remarks".

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

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

Learning Outcomes
The 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 monopoles 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.

Remarks
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

Module: Environmental Economics [WI4VWL5]

Coordination: Kay Mitusch
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25547	Environmental Economics and Sustainability	2/1	W	5	R. Walz
25548	Environmental and Ressource Policy	2/1	S	5	R. Walz
26003	Energy and Environment	2/1	S	4,5	U. Karl, n.n.
24140	Environmental Law	2	W	3	I. Spiecker genannt Döhmann
26230	Transport Economics	2/1	S	4.5	G. Liedtke, E. Szimba

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 offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
Note the changes in course offering under "remarks".

Conditions
None.

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

Learning Outcomes

Content

Module: Economic Policy [WI4VWL6]

Coordination: Jan Kowalski
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26280	Economic Policy	2/1	S	5	A. Schaffer
26257	Economic integration in Europe	2	W	4	J. Kowalski
26236	Innovationtheory and -policy	2/1	S	4,5	I. Ott

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 offerd at every ordinary examination date. The assessment procedures are described for each course of the module seperately.
The overall grade for the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
Note the changes in course offering under “remarks”.

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

Module: Allocation and Equilibrium [WI4VWL7]

Coordination: Clemens Puppe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25527	Advanced Topics in Economic Theory	2/1	S	4.5	C. Puppe, M. Hillebrand, K. Mitusch
25517	Welfare Economics	2/1	S	4.5	C. Puppe
25549	Theory of Business Cycles	2/1	W	4.5	M. Hillebrand

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

Conditions
None.

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

Learning Outcomes

Content

Module: Macroeconomic Theory [WI4VWL8]

Coordination: Clemens Puppe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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

Conditions
None.

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

Learning Outcomes

Content

Module: Social Choice Theory [WI4VWL9]

Coordination: Clemens Puppe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
None.

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

Learning Outcomes

Content

Module: Innovation and growth [WW4VWLIWW1]

Coordination: Ingrid Ott
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Economics

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25543	Theory of Economic Growth	2/1	S	4,5	M. Hillebrand
26236	Innovationtheory and -policy	2/1	S	4,5	I. Ott
25503	Theory of endogenous growth	2/1	W	4,5	I. Ott

Learning Control / Examinations

Conditions
None.

Learning Outcomes

Content

5.3 Informatics

Module: Informatics [WI4INFO1]

Coordination: Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Rudi Studer, Stefan Tai
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	A. Oberweis, R. Studer, S. Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	S. Tai
25760	Complexity Management	2/1	S	5	D. Seese
25720	Database Systems	2/1	S	5	A. Oberweis, Dr. D. Sommer
25728	Software Engineering	2/1	W	5	A. Oberweis, D. Seese
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
25740	Knowledge Management	2/1	W	5	R. Studer
25776	Cloud Computing	2/1	W	5	S. Tai, Kunze
25724	Database Systems and XML	2/1	W	5	A. Oberweis
25735	Document Management and Groupware Systems	2	S	4	S. Klink
25700	Efficient Algorithms	2/1	S	5	H. Schmeck
25786	Enterprise Architecture Management	2/1	W	5	T. Wolf
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
25764	IT Complexity in Practice	2/1	W	5	D. Seese, Kreidler
25742	Knowledge Discovery	2/1	W	5	R. Studer
25784	Management of IT-Projects	2/1	S	5	R. Schätzle
25736	Business Process Modelling	2/1	W	5	A. Oberweis, M. Mevius
25706	Nature-inspired Optimisation	2/1	W	5	S. Mostaghim, P. Shukla
25704	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	R. Kneuper
25748	Semantic Web Technologies I	2/1	W	5	R. Studer, S. Rudolph, A. Harth
25750	Semantic Web Technologies II	2/1	S	5	S. Agarwal, S. Grimm, E. Simperl, A. Harth
25772	Service Oriented Computing 2	2/1	S	5	S. Tai, R. Studer
25730	Software Technology: Quality Management	2/1	S	5	A. Oberweis
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	H. Schmeck
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	A. Oberweis
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	D. Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	A. Oberweis, D. Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	R. Studer
25788	Strategic Management of Information Technology	2/1	S	5	T. Wolf
25774	Web Service Engineering	2/1	S	5	C. Zirpins
25726	Workflow-Management	2/1	S	5	A. Oberweis
25810	Practical Seminar Knowledge Discovery	2	S	4	R. Studer
PraBI	Computing Lab Information Systems	2	W/S	4	A. Oberweis, D. Seese, R. Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	H. Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	D. Seese
25818	Computing Lab in Complexity Management	3	W/S	4	D. Seese
25820	Lab Class Web Services	2	W	4	S. Tai, R. Studer, G. Satzger, C. Zirpins
25740p	Ecxercises in Knowlegde Management	3	W/S	4	R. Studer
25791	n.n.	2/0	W	4	R. Kneuper
26458	Computational Economics	2/1	W	4,5	S. Caton, P. Shukla

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.

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 innovativness 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.

Module: Emphasis in Informatics [WI4INFO2]

Coordination: Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Rudi Studer, Stefan Tai
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	A. Oberweis, R. Studer, S. Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	S. Tai
25760	Complexity Management	2/1	S	5	D. Seese
25720	Database Systems	2/1	S	5	A. Oberweis, Dr. D. Sommer
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
25728	Software Engineering	2/1	W	5	A. Oberweis, D. Seese
25740	Knowledge Management	2/1	W	5	R. Studer
25724	Database Systems and XML	2/1	W	5	A. Oberweis
25735	Document Management and Groupware Systems	2	S	4	S. Klink
25700	Efficient Algorithms	2/1	S	5	H. Schmeck
25786	Enterprise Architecture Management	2/1	W	5	T. Wolf
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
25764	IT Complexity in Practice	2/1	W	5	D. Seese, Kreidler
25742	Knowledge Discovery	2/1	W	5	R. Studer
25784	Management of IT-Projects	2/1	S	5	R. Schätzle
25736	Business Process Modelling	2/1	W	5	A. Oberweis, M. Mevius
25706	Nature-inspired Optimisation	2/1	W	5	S. Mostaghim, P. Shukla
25704	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	R. Kneuper
25748	Semantic Web Technologies I	2/1	W	5	R. Studer, S. Rudolph, A. Harth
25750	Semantic Web Technologies II	2/1	S	5	S. Agarwal, S. Grimm, E. Simperl, A. Harth
25772	Service Oriented Computing 2	2/1	S	5	S. Tai, R. Studer
25730	Software Technology: Quality Management	2/1	S	5	A. Oberweis
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	A. Oberweis
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	H. Schmeck
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	D. Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	A. Oberweis, D. Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	R. Studer
25788	Strategic Management of Information Technology	2/1	S	5	T. Wolf
25774	Web Service Engineering	2/1	S	5	C. Zirpins
25726	Workflow-Management	2/1	S	5	A. Oberweis
PraBI	Computing Lab Information Systems	2	W/S	4	A. Oberweis, D. Seese, R. Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	H. Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	D. Seese
25818	Computing Lab in Complexity Management	3	W/S	4	D. Seese
25810	Practical Seminar Knowledge Discovery	2	S	4	R. Studer
25820	Lab Class Web Services	2	W	4	S. Tai, R. Studer, G. Satzger, C. Zirpins
25740p	Ecxercises in Knowlegde Management	3	W/S	4	R. Studer
25776	Cloud Computing	2/1	W	5	S. Tai, Kunze
25791	n.n.	2/0	W	4	R. Kneuper
26458	Computational Economics	2/1	W	4,5	S. Caton, P. Shukla

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.

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

Learning Outcomes
The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativness 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.

Module: Electives in Informatic [WI4INFO3]

Coordination: Hartmut Schmeck, Andreas Oberweis, Detlef Seese, Rudi Studer, Stefan Tai
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Informatics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25070	Applied Informatics I - Modelling	2/1	W	5	A. Oberweis, R. Studer, S. Agarwal
25033	Applied Informatics II - IT Systems for e-Commerce	2/1	S	5	S. Tai
25760	Complexity Management	2/1	S	5	D. Seese
25720	Database Systems	2/1	S	5	A. Oberweis, Dr. D. Sommer
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
25728	Software Engineering	2/1	W	5	A. Oberweis, D. Seese
25740	Knowledge Management	2/1	W	5	R. Studer
25724	Database Systems and XML	2/1	W	5	A. Oberweis
25735	Document Management and Groupware Systems	2	S	4	S. Klink
25700	Efficient Algorithms	2/1	S	5	H. Schmeck
25786	Enterprise Architecture Management	2/1	W	5	T. Wolf
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
25764	IT Complexity in Practice	2/1	W	5	D. Seese, Kreidler
25742	Knowledge Discovery	2/1	W	5	R. Studer
25784	Management of IT-Projects	2/1	S	5	R. Schätzle
25736	Business Process Modelling	2/1	W	5	A. Oberweis, M. Mevius
25706	Nature-inspired Optimisation	2/1	W	5	S. Mostaghim, P. Shukla
25704	Organic Computing	2/1	S	5	H. Schmeck, S. Mostaghim
25790	Capability maturity models for software and systems engineering	2	S	4	R. Kneuper
25748	Semantic Web Technologies I	2/1	W	5	R. Studer, S. Rudolph, A. Harth
25750	Semantic Web Technologies II	2/1	S	5	S. Agarwal, S. Grimm, E. Simperl, A. Harth
25772	Service Oriented Computing 2	2/1	S	5	S. Tai, R. Studer
25730	Software Technology: Quality Management	2/1	S	5	A. Oberweis
SBI	Special Topics of Enterprise Information Systems	2/1	W/S	5	A. Oberweis
25700sp	Special Topics of Efficient Algorithms	2/1	W/S	5	H. Schmeck
KompMansp	Special Topics of Complexity Management	2/1	W/S	5	D. Seese
SSEsp	Special Topics of Software- and Systemsengineering	2/1	W/S	5	A. Oberweis, D. Seese
25860sem	Special Topics of Knowledge Management	2/1	W/S	5	R. Studer
25788	Strategic Management of Information Technology	2/1	S	5	T. Wolf
25774	Web Service Engineering	2/1	S	5	C. Zirpins
25726	Workflow-Management	2/1	S	5	A. Oberweis
PraBI	Computing Lab Information Systems	2	W/S	4	A. Oberweis, D. Seese, R. Studer
25700p	Advanced Lab in Efficient Algorithms	3	W/S	4	H. Schmeck
25762p	Computing Lab in Intelligent Systems in Finance	3	W/S	4	D. Seese
25810	Practical Seminar Knowledge Discovery	2	S	4	R. Studer
25818	Computing Lab in Complexity Management	3	W/S	4	D. Seese
25820	Lab Class Web Services	2	W	4	S. Tai, R. Studer, G. Satzger, C. Zirpins
25740p	Ecxercises in Knowlegde Management	3	W/S	4	R. Studer
25776	Cloud Computing	2/1	W	5	S. Tai, Kunze
25791	n.n.	2/0	W	4	R. Kneuper
26458	Computational Economics	2/1	W	4,5	S. Caton, P. Shukla

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.

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

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

Learning Outcomes
The student

- has the ability to master methods and tools in a complex discipline and to demonstrate innovativness 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.

5.4 Operations Research

Module: Quantitative Marketing and OR [WI4OR1]

Coordination: Wolfgang Gaul
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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.

Conditions
None.

Learning Outcomes

Content

Module: Operations Research in Supply Chain Management and Health Care Management [WI4OR5]

Coordination: Stefan Nickel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25486	Facility Location and Strategic Supply Chain Management	2/1	S	4.5	S. Nickel
25488	Tactical and Operational Supply Chain Management	2/1	W	4.5	S. Nickel
n.n.	Operations Research in Supply Chain Management	2/1	S	4.5	S. Nickel
25495	Operations Research in Health Care Management	2/1	S	4.5	S. Nickel
25493	Hospital Management	2/0	W/S	2	S. Nickel, Hansis
25498	Practical seminar: Health Care Management (with Case Studies)	2/1/2	W/S	7	S. Nickel
25497	Software Laboratory: OR Models II	2/1	S	4.5	S. Nickel
n.n.	Software Laboratory: Simulation	2/1	S	4.5	S. Nickel
n.n.	Software Laboratory: SAP APO	2/1	S	4.5	S. Nickel
25494	Production Planning and Scheduling	2/1	S	4.5	J. Kalcsics

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

Conditions
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.

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

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 Suppy Chain Mangement, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.
Health Care Management addresses specific Supply Chain Management problems in the health sector. Important applications arise in scheduling and internal logistics of hospitals.

Remarks
Some lectures and courses are offered irregularly.
The planned lectures and courses for the next three years are announced online.

Module: Mathematical Programming [WI4OR6]

Coordination: Oliver Stein
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25138	Mixed Integer Programming I	2/1	S	4.5	O. Stein
25140	Mixed Integer Programming II	2/1	W	4.5	O. Stein
25128	Special Topics in Optimization I	2/1	W/S	4.5	O. Stein
25126	Special Topics in Optimization II	2/1	W/S	4.5	O. Stein
25484	Graph Theory and Advanced Location Models	2/1	W	4.5	S. Nickel
25497	Software Laboratory: OR Models II	2/1	S	4.5	S. Nickel
25111	Nonlinear Optimization I	2/1	S	4.5	O. Stein
25113	Nonlinear Optimization II	2/1	S	4.5	O. Stein
25134	Global Optimization I	2/1	W	4.5	O. Stein
25136	Global Optimization II	2/1	W	4.5	O. Stein

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

Conditions
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 makes suggestions to adapt them to practical problems.

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

Remarks
The lectures are partly offered irregularly. The curriculum of the next three years is available online (www.ior.kit.edu).
For the lectures of Prof. Stein a grade of 30 % of the exercise course has to be fulfilled. The description of the particular lectures is more detailed.

Module: Stochastic Modelling and Optimization [WI4OR7]

Coordination: Karl-Heinz Waldmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Operations Research

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25679	Markov Decision Models I	2/1/2	W	5	K. Waldmann
25682	Markov Decision Models II	2/1/2	S	4.5	K. Waldmann
25674	Quality Control I	2/1/2	W	4.5	K. Waldmann
25659	Quality Control II	2/1/2	S	4.5	K. Waldmann
25687	Optimization in a Random Environment	2/1/2	W/S	4.5	K. Waldmann
25662	Simulation I	2/1/2	W	4.5	K. Waldmann
25665	Simulation II	2/1/2	S	4.5	K. Waldmann
25688	OR-oriented modeling and analysis of real problems (project)	1/0/3	W/S	4.5	K. Waldmann

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

Conditions
None.

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

Content
see courses

5.5 Statistics

Module: Mathematical and Empirical Finance [WI4STAT1]

Coordination: Svetlozar Rachev
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

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

Learning Outcomes

Content

Module: Statistical Methods in Risk Management [WI4STAT2]

Coordination: Svetlozar Rachev
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

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

Learning Outcomes

Content

Module: Risk Management and Econometrics in Finance [WI4STAT3]

Coordination: Svetlozar Rachev
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Statistics

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
None.

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

Learning Outcomes

Content

5.6 Engineering Sciences

Module: Selected Chapters from Production Engineering I [WI4INGMB1]

Coordination: Volker Schulze
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149657	Manufacturing Engineering	4/1	W	9	V. Schulze
2150660	Integrated Production Planning	4/2	S	9	Lanza, Gisela
2149900	Machine Tools and Industrial Handling I	2/1	W	4	Munzinger
2149901	Machine Tools and Industrial Handling II	2/1	W	4,5	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
2149669	Materials and Processes in Automotive Lightweight Construction	2	W	4	Haepp
2149667	Quality Management	2	W	4	Lanza, Gisela
2150690	Production Systems and Production Technology in Major Assembly Production	2	S	4	Stauch
21690sem	Seminar paper “Production Engineering”	2	W/S	3	V. Schulze, Lanza, Munzinger

Learning Control / Examinations
Module exams take the form of written examinations (as per §4(2), 1 SPO [study and examination regulations]) about the different lectures and seminars of the module. Exams can be taken each semester during the lecture-free period and can be retaken at every official examination date. Performance assessments will be completed for every lecture and seminar of the module. The overall grade will be created from the grades of the partial examinations weighted with the respective CPs. Optionally, the module grade can be improved by writing a seminar paper (as per §4(2), 3 SPO [study and examination regulations]) at wbk Institute of Production Science.

Conditions
None.

Recommendations
It is recommended to attend or to have successfully attended at least one of the basic lectures *Manufacturing Engineering*, *Integrated Production Planning*, and *Machine Tools I/II*.

Learning Outcomes
The student

- has thorough knowledge of the subject matters covered by the production engineering modules (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use this knowledge in a targeted and skilful way for an efficient production engineering

Content
This module from the field of engineering science provides thorough knowledge of production engineering, including advanced courses on selected aspects of production engineering in addition to manufacturing engineering, machine tools and handling technology and organisation and planning. Students will be given hands-on demonstrations by means of examples from industry.

Module: Selected Chapters from Production Engineering II [WI4INGMB2]

Coordination: Volker Schulze
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149657	Manufacturing Engineering	4/1	W	9	V. Schulze
2150660	Integrated Production Planning	4/2	S	9	Lanza, Gisela
2149900	Machine Tools and Industrial Handling I	2/1	W	4	Munzinger
2149901	Machine Tools and Industrial Handling II	2/1	W	4,5	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
2149669	Materials and Processes in Automotive Lightweight Construction	2	W	4	Haepp
2149667	Quality Management	2	W	4	Lanza, Gisela
2150690	Production Systems and Production Technology in Major Assembly Production	2	S	4	Stauch
21690sem	Seminar paper “Production Engineering”	2	W/S	3	V. Schulze, Lanza, Munzinger

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

Conditions
None.

Recommendations
It is recommended to attend or to have successfully attended at least one of the basic lectures *Manufacturing Engineering*, *Integrated Production Planning*, and *Machine Tools I/II*.

Learning Outcomes
The student

- has thorough knowledge of the subject matters covered by the production engineering modules (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use this knowledge in a targeted and skilful way for an efficient production engineering

Content
This module from the field of engineering science provides thorough knowledge of production engineering, including advanced courses on selected aspects of production engineering in addition to manufacturing engineering, machine tools and handling technology and organisation and planning. Students will be given hands-on demonstrations by means of examples from industry

Module: Selected Chapters from Production Engineering III [WI4INGMB3]

Coordination: Volker Schulze
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
27	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149657	Manufacturing Engineering	4/1	W	9	V. Schulze
2150660	Integrated Production Planning	4/2	S	9	Lanza, Gisela
2149900	Machine Tools and Industrial Handling I	2/1	W	4	Munzinger
2149901	Machine Tools and Industrial Handling II	2/1	W	4,5	Munzinger
21692	International Production and Logistics	2	S	3	Lanza
2149669	Materials and Processes in Automotive Lightweight Construction	2	W	4	Haepp
2149667	Quality Management	2	W	4	Lanza, Gisela
2150690	Production Systems and Production Technology in Major Assembly Production	2	S	4	Stauch
21690sem	Seminar paper “Production Engineering”	2	W/S	3	V. Schulze, Lanza, Munzinger

Learning Control / Examinations
Module exams take the form of written examinations (as per §4(2), 1 SPO [study and examination regulations]) about the different lectures and seminars of the module. Exams can be taken each semester during the lecture-free period and can be retaken at every official examination date. Performance assessments will be completed for every lecture and seminar of the module. The overall grade will be created from the grades of the partial examinations weighted with the respective CPs. Optionally, the module grade can be improved by writing a seminar paper (as per §4(2), 3 SPO [study and examination regulations]) at wbk Institute of Production Science.

Conditions
None.

Recommendations
It is recommended to attend or to have successfully attended at least one of the basic lectures *Manufacturing Engineering*, *Integrated Production Planning*, and *Machine Tools I/II*.

Learning Outcomes
The student

- has thorough knowledge of the subject matters covered by the production engineering modules (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use this knowledge in a targeted and skilful way for an efficient production engineering

Content
This module from the field of engineering science provides thorough knowledge of production engineering, including advanced courses on selected aspects of production engineering in addition to manufacturing engineering, machine tools and handling technology and organisation and planning. Students will be given hands-on demonstrations by means of examples from industry.

Module: Introduction to Logistics [WI4INGMB20]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21051	Material Flow in Logistic Systems	3/1	W	6	K. Furmans
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo
2118083	IT for Facility Logistics	3/1	S	6	Thomas
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21056	Airport Logistics	2	W	4	Richter
21061	Safety Engineering	2	W	4	Kany
21064	Industrial Application of Technological Logistics instancing Crane Systems	2	W	4	Golder
2118089	Industrial Application of Material Handling Systems in Sorting and Distribution Systems	2	S	4	Föller
2118085	Automotive Logistics	2	S	4	K. Furmans
2118094	Information Systems and Supply Chain Management	2	S	4	Kilger
2117500	Energy efficient intralogistic systems	2	W	4	Schönung
2117081		2/1	W	4	M. Mittwollen
2117082	Technical Logistics I, basics and systems	3/1	W	6 (ggf. kontextabhängig)	M. Mittwollen

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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. The term paper may not be convalidated in the seminar module.

Conditions
It is obligatory to choose one of the following courses:

- *Material Flow in Logistic Systems*
- *Technical Logistics I*
- *Quantitative Risk Management of Logistic Systems*

Apart from that, one additional course has to be chosen from the remaining courses.

Learning Outcomes
The student

- acquires an overview of different logistic questions in practice,
- is able to model logistic systems with adequate accuracy by using simple models,
- is able to handle analytical methods for a performance evaluation of logistic systems,
- is able to identify cause and effects within logistic systems.

Content
The module *Introduction to Logistics* provides well-founded knowledge in main questions of logistics. In this module, focuses on the acquisition of theoretical basics linked with exemplary practice questions are laid. To gain a deeper understanding, the course is accompanied by exercises and further improved by case studies.

Remarks
The courses *Technische Logistik I, Grundlagen* [2117081] *and Technische Logistik I, Grundlagen und Systeme* [2117082] are changed in content against the former course *Technische Logistik I* [2117501]. They can be taken alternatively.
All courses with two lecture hours per week have 4 CP.

Module: Technical Logistics and Logistic Systems [WI4INGMB11]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2118078	Logistics - Organisation, Design, and Control of Logistic Systems	3/1	S	6	K. Furmans
21051	Material Flow in Logistic Systems	3/1	W	6	K. Furmans
21060	Analytical Models for Material Flow	3/1	W	6	K. Furmans
21062	Supply Chain Management	3/1	W	6	Alicke
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo
2118083	IT for Facility Logistics	3/1	S	6	Thomas
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21056	Airport Logistics	2	W	4	Richter
2118085	Automotive Logistics	2	S	4	K. Furmans
21061	Safety Engineering	2	W	4	Kany
21064	Industrial Application of Technological Logistics instancing Crane Systems	2	W	4	Golder
2118089	Industrial Application of Material Handling Systems in Sorting and Distribution Systems	2	S	4	Föller
2118094	Information Systems and Supply Chain Management	2	S	4	Kilger
2117500	Energy efficient intralogistic systems	2	W	4	Schönung
2117081		2/1	W	4	M. Mittwollen
2117082	Technical Logistics I, basics and systems	3/1	W	6 (ggf. kontextabhängig)	M. Mittwollen
2118081	Technical Logistics II, selected application examples	2/1	S	4	M. Mittwollen
2149610	Global Production and Logistics - part 1: Global Production	2	W	4	Lanza
2149600	Global Production and Logistics - part 2: Global Logistics	2	S	4	K. Furmans

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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. The term paper may not be convalidated in the seminar module.

Conditions
It is obligatory to choose two of the following courses:

- *Logistics - Organisation, Design, and Control of Logistic Systems*
- *Material Flow in Logistic Systems*
- *Technical Logistics I*
- *Analytical Models for Material Flow*
- *IT for Facility Logistics*
- *Supply Chain Management*
- *Quantitative Methods for Supply Chain Risk Management*

Learning Outcomes
The student

- acquires comprehensive and well-founded knowledge about the main questions of logistics, an overview of different logistic questions in practice and knows the functionality and components of conveyor technology systems,
- is able to illustrate logistic systems with adequate accuracy by using simple models,
- is able to handle analytical methods for a performance evaluation of logistic systems,
- is able to realize coherences within logistic systems,
- is able to evaluate logistic systems by using the learnt methods.

Content
The module *Technical Logistics and Logistic Systems* provides comprehensive and well-founded insights into main topics of logistics. Within the framework of the lectures, the interaction between several components of logistic systems will be shown. The module focuses on technical characteristics of conveyor technique as well as on methods for illustrating and evaluating logistics systems. To gain a deeper understanding, the course is accompanied by exercises and further improved by case studies.

Remarks
See German version.

Module: Automotive Engineering [WI4INGMB5]

Coordination: Frank Gauterin
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2113805	Basics of Automotive Engineering I	4	W	6	F. Gauterin, Unrau
2114835	Basics of Automotive Engineering II	2	S	3	F. Gauterin, Unrau
2115817	Project Workshop-Automative Engineering	3	W/S	4.5	F. 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	M. Geimer
21092	CAN-Bus Release Control	2	S	3	M. Geimer

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

Conditions
None.

Recommendations
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.

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

Module: Handling Characteristics of Motor Vehicles [WI4INGMB6]

Coordination: Frank Gauterin
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2113806	Vehicle Comfort and Acoustics I	2	W	3	F. Gauterin
2114825	Vehicle Comfort and Acoustics II	2	S	3	F. Gauterin
2113807	Handling Characteristics of Motor Vehicles I	2	W	3	Unrau
2114838	Handling Characteristics of Motor Vehicles II	2	S	3	F. Gauterin
2115817	Project Workshop-Automative Engineering	3	W/S	4.5	F. Gauterin
2113816	Vehicle Mechatronics I	2	W	3	Ammon
21850	Driving Dynamics Evaluation within the Global Vehicle Simulation	2/0	S	3	Schick

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

Conditions
None.

Recommendations
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.

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

Module: Vehicle Development [WI4INGMB14]

Coordination: Frank Gauterin
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2115817	Project Workshop-Automative Engineering	3	W/S	4.5	F. Gauterin
2113816	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	M. Geimer

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

Conditions
None.

Recommendations
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.

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

Module: Mobile Machines [WI4INGMB15]

Coordination: Marcus Geimer
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21093	Fluid Power Systems	2	S	3	M. Geimer
21095	Simulation of coupled systems	2	S	3	M. Geimer
21092	CAN-Bus Release Control	2	S	3	M. Geimer
21073	Mobile Machines	4	W	6	M. 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

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 seperately.

Conditions
None.

Recommendations
Knowledge of Fluid Power Systems are helpful, otherwise it is recommended to take the course *Fluid Power Systems* [21093].

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.

Module: Combustion Engines [WI4INGMB16]

Coordination: Heiko Kubach
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21101	Combustion Engines A	4/2	W	9	Spicher
21135	Combustion Engines B	2/1	S	5	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

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

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

Recommendations
Knowledge in the area of thermodynamics is helpful.

Learning Outcomes

Content

Module: Engine Development [WI4INGMB17]

Coordination: Heiko Kubach
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21101	Combustion Engines A	4/2	W	9	Spicher
21135	Combustion Engines B	2/1	S	5	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

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

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

Recommendations
Knowledge in the area of thermodynamics is helpful.

Learning Outcomes

Content

Module: Specific Topics in Material Science [WI4INGMB18]

Coordination: M. J. Hoffmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21643	Constitution and Properties of Wear-resistant materials	2	W/S	4	Ulrich
21601	Constitution and Properties of Protective Coatings	2	W	4	Ulrich
21755	Introduction in Ceramics	2	W	4	M. Hoffmann
21560	Experimental Lab Class in Welding Technology, in Groups	3	W	1	V. Schulze
21575	Foundry Technology	2	S	4	Wilhelm
21754	Principles of Ceramic and Powder Metallurgy Processing	2	W	4	Oberacker
21642	Laser Application in Automotive Engineering	2	S	4	Schneider
21640	Laser Materials Processing	3	W/S	1	Schneider
21612	Physical Basics of Laser Technology	2/1	W	5	Schneider
21596	Polymerengineering II	2	S	4	P. Elsner
21590	Polymerengineering I	2	W	4	P. Elsner
21751	Practical Course in Engineering Ceramics	2	W	1	Porz
21562	Failure Analysis	2	W	4	Poser-Keppler
21565/21570	Welding Technology I/II	2	W/S	4	Spies
21775	Structural and Functional Ceramics	2	S	4	M. Hoffmann
21618	Superhard Thin Film Materials	2	W/S	4	Ulrich
21576	Systematic Selection of Materials	2/1	S	5	Wanner
21715	Failure of Structural Materials: Fatigue and Creep	2	W	4	Gruber
21711	Failure of Structural Materials: Deformation and Fracture	2	W	4	Weygand
21574	Materials of Leightweight Construction	2	S	4	Weidenmann
21553	Material Science and Engineering III	4/1	W	6	Wanner

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

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

Recommendations
Knowledge, comparable to the content of the module *Emphasis Material Science* [WI3INGMB9], is highly recommended.
Natural science basic knowledge is assumed.

Learning Outcomes

Content

Module: Virtual Engineering [WI4INGMB22]

Coordination: Jivka Ovtcharova
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21352	Virtual Engineering I	2/3	W	6	J. Ovtcharova
21378	Virtual Engineering II	2/1	S	4	
21360	Virtual Engineering for Mechatronic Products	3/0	W	4	J. Ovtcharova, S. Rude
21364/21365	Product, Process and Ressource Integration in the Automotive Development	2/1	W/S	4	S. Mbang
21387	Computer Integrated Planning of New Products	2/0	S	4	R. Kläger
21264	Simulation Methods in Product Development Process	2/1	W	4.5	J. Ovtcharova, A. Albers, T. Böhlke
2122371	Efficient Creativity - Processes and Methods within the Automotive Industry	2	S	4	Lamberti

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).

Conditions
None.

Learning Outcomes

Content

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

Coordination: Ralf Roos
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

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

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 conjointed 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 ecxamination 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.

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

Module: Highway Engineering [WI4INGBGU2]

Coordination: Ralf Roos
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

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

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.

Conditions
The successful completion of the course *Design Basics in Highway Engineering* [19026] is assumed. This course may be attended in the module *Design, Construction, Operation and Maintenance Highways* or be already completed in a previous study programme.
The participation in the project Integrated Planning within the branch Highway Engineering or writing a student research paper is obligatory.

Learning Outcomes

Content

Module: Safety, Computing and Law in Highway Engineering [WI4INGBGU3]

Coordination: Ralf Roos
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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.

Conditions
The successful completion of the course *Design Basics in Highway Engineering* [19026] is assumed. This course may be attended in the module *Design, Construction, Operation and Maintenance Highways* or be already completed in a previous study programme.

Learning Outcomes

Content

Module: Public Transportation Operations [WI4INGBGU4]

Coordination: Michael Weigel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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.

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

Module: Project in Public Transportation [WI4INGBGU5]

Coordination: Michael Weigel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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.

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

Module: Guided Systems Engineering [WI4INGBGU6]

Coordination: Michael Weigel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

Learning Control / Examinations

Conditions
The completion of the module *Foundations of Guided Systems* [WW3INGBGU2] or *Logistic and Management of Guided Systems* [WI4INGBGU7] is assumed.
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 Sytems* [19326] are obligatory and have to be attended.

Learning Outcomes

Content

Module: Logistics and Management of Guided Systems [WI4INGBGU7]

Coordination: Michael Weigel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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.

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

Learning Outcomes

Content

Module: Transportation Systems [WI4INGBGU8]

Coordination: Dirk Zumkeller
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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	P. Vortisch, B. Chlond
19301w	Transport Planning Methods	1/1	W	3	P. Vortisch
19062	Transport System Planning	2/1	S	4.5	P. Vortisch
19308	Freight Transport	1	W	1.5	B. Chlond

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 moduleis the average of the marks for each exam weighted by the credits and truncated after the first decimal.

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
The students

- know and understand the fundamental principles of the transportation system
- will learn the systemic perspective from the transportation field against the perspectives of inndividuals or enterprises
- will thus be able to integrate both perspectives in the planning and optimization of processes

Content
The logistics optimizes processes from the perspective of enterprises. This is in conflict with the ideas of an optimised overall system. This module deals with the superior perspective of the transport system and such thus offers the chance to incorporate and understand both perspectives. The courses lay their emphasis more on transport planning field than on traffic engineering.

The module addresses itself to students in logistics who besides the perspective from the enterprises should be aware of the societal perspective (transport system).

Module: Transportation Ia [WI4INGBGU9]

Coordination: Dirk Zumkeller
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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	P. Vortisch, B. Chlond
19301w	Transport Planning Methods	1/1	W	3	P. Vortisch
19303w	Traffic Engineering and Traffic Telematics	1/1	W	3	B. Chlond

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.

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
The students

- will have basic knowledge about the methodologies of transportation planning and traffic engineering from the perspective of the practioners (planners and engineers),
- will know the relevant aspects form the transportation sector in order to work in the management of transport authorities or the consulting sector.
- will be able, to analyse, to assess and to develop planning concepts from both perspectives.

Content
The transportation discipline deals with issues in the transport sector which range from planning concepts judged by overall societal criteria to technical problems of the organisation of flows of traffic. Alongside engineering and scientific methods, understanding from the social sciences (economics, ecology, empirical social research) needs to be integrated into the development of approaches to solutions for these problems. Therefore the courses are interdisciplinary.

Within the module all areas (transport planning methodology, knowledge about potential measures for influencing behaviour, the fundamentals of traffic engineering) will be dealt with.

Module: Transport Ib [WI4INGBGU10]

Coordination: Dirk Zumkeller
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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 moduleis the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Conditions
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].

Learning Outcomes
The students

- will have basic knowledge about the methodologies of transportation planning and traffic engineering from the perspective of the practioners (planners and engineers),
- will know the relevant aspects form the transportation sector in order to work in the management of transport authorities or the consulting sector.
- will be able, to analyse, to assess and to develop planning concepts from both perspectives

Content
The transportation discipline deals with issues in the transport sector which range from planning concepts judged by overall societal criteria to technical problems of the organisation of flows of traffic. Alongside engineering and scientific methods, understanding from the social sciences (economics, ecology, empirical social research) needs to be integrated into the development of approaches to solutions for these problems. Therefore the courses are interdisciplinary.

Within the module relevant areas (transport planning methodology, knowledge about potential measures for influencing behaviour, the fundamentals of traffic engineering) will be dealt with.

Interest in the transportation sector will be required.

Module: Transportation II [WI4INGBGU11]

Coordination: Dirk Zumkeller
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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 moduleis the average of the marks for each exam weighted by the credits and truncated after the first decimal.

Conditions
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.
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.
Besiedes 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
The students

- will have specialized knowledge in certain fields either of transportation planning or traffic engineering.
- will have applied relevant planning or traffic engineering software
- will be able to apply these knowledge in accordance to his/her profile in (planner or traffic engineer, specialization in transit) in the professional practice.

Content
The module is oriented at those who want to specialise in transport and like to work in this field. The courses have to be understood as an amendmend to the fundamental courses and include e.g. the application of software or the relevant legal framework for public transport / transit planning. Besides the courses from the Institute of Verkehrswesen other courses can be chosen from nearby disciplines such as “Spatial Planning”, “Highway and Railroad Engineering”, “Vehicle Construction” if this makes sense. In order to choose the relevant and appropriate combination of courses a consultation is heavily recommended. It is also necessary to agree the courses with the institute.

Module: Environmental Management [WI4INGBGU12]

Coordination: Erhard Hoffmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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 seperately (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)
- 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.

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].

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

Learning Outcomes
The students develop system thinking and gain applicable knowledge and tools in regard to engineering methods.

Content

Module: Water Supply and Sanitation [WI4INGBGU13]

Coordination: Erhard Hoffmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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	S. Fuchs, J. Winter
19054	Process Engineering in Water Quality Management	2	S	3	E. Hoffmann
19243/44	Design of Wastewater Treatment Plants and Biosolids Reclaiming Systems (Design of Urban Water and Wastewater Management Systems)	1/1	W	3	E. Hoffmann
19248	Design and Planning of Urban Drainage Systems	1	S	1.5	S. Fuchs
19249	Semi- and Decentral Systems	1	S	1.5	E. Hoffmann, S. Fuchs
19054p	Laboratory - Process Engineering in Water Quality Management	2	S	1.5	E. Hoffmann
19059	Process Engineering in Waste Management	2	S	3	J. Winter

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 seperately (according to §4(2), 1 and 2 of the examination regulation).

- *Urban Water Ressource Management and Ecological Engineering* [19057/58]: written exam (40 min)
- 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.

Conditions
None.

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

Learning Outcomes

Content

- Operation in the field of urban waste management
- Particular emphasis in regard to the Millenium Development

Module: Control Engineering I [WI4INGETIT1]

Coordination: Mathias Kluwe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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

Conditions
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 attented before the course *Optimisation of Dynamic Systems* [23180].

Recommendations
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.

Learning Outcomes
The students

- get familiar with the basic concepts of cotrol 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 anlisys and design of dynamic systems are considered.

Module: Control Engineering II [WI4INGETIT2]

Coordination: Mathias Kluwe
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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

Conditions
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.

Learning Outcomes
The students

- have deeper knowledge in the field of conrol 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 continious and time discrete modells are considered and methods for the analysis and the control design with different goals (decoupling, ronustness) 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.

Module: Sensor Technology I [WI4INGETIT3]

Coordination: Wolfgang Menesklou
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
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.

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

Learning Outcomes
The student

- acquires fundamental principles in materials science and device technology of sensors.
- applies materials and sensors from the viewpoint of an application or development engineer.

Content
The operating principles of the most important sensors are taught. The student will learn to use the acquired knowledge for key issues relating to select and use sensors. Module *Sensor Technology I* gives an overview of the basic sensor principles. Module *Sensor Technology II* goes into specific topics of sensors and actuators further.

Module: Sensor Technology II [WI4INGETIT5]

Coordination: Wolfgang Menesklou
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
It is only possible to choose this module in combination with the module *Sensor Technology I* [WI4INGETIT3]. The module is passed only after the final partial exam of *Sensor Technology I* is additionally passed.

Recommendations
Courses *Elektrotechnik II* [23224] and *Werkstoffkunde II* [21553] should have been taken before.

Learning Outcomes
The student

- acquires fundamental principles in materials science and device technology of sensors.
- applies materials and sensors from the viewpoint of an application or development engineer.

Content
The operating principles of the most important sensors are taught. The student will learn to use the acquired knowledge for key issues relating to select and use sensors. Sensor module I gives an overview of the basic sensor principles. Sensor module II goes into specific topics of sensors and actuators further.

Module: Electrical Power Engineering [WI4INGETIT4]

Coordination: Bernd Hoferer, Thomas Leibfried
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	2

Courses in module

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	T. 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	W	4.5	Badent
23361/23363	High-Voltage Technology II	2/1	S	4.5	Badent
23392/23394	High-Voltage Test Technique	2/1	W	4.5	Badent

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

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

Learning Outcomes
The student

- has wide knowledge of electrcal power engineering,
- is capable to analyse and develope 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.

Remarks
The course *Lectures on HVDC and FACTS – Benefits of Power Electronics for Security and Sustainability of Power Supply* [23385] is not offered any more. For exams please contact the institute.
The course *High-Voltage Technology I* [23360] is now offered in winter term, *High-Voltage Technology II* [23361] in summer term.

Module: Fuels, Environment and Global Development [WI4INGCV2]

Coordination: Georg Schaub
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	2

Courses in module

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	G. 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	G. Schaub

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 seperately.

Conditions
None.

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

Learning Outcomes

Content

Remarks
The module is not offered any more. It can be completed in winter term 2010/11. Afterwards student have to contact the co-ordinator in order to finish the module.

Module: Principles of Food Process Engineering [WI4INGCV3]

Coordination: Volker Gaukel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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	V. Gaukel
22214	Principles of Process Engineering referring to Food II	2	S	4	V. Gaukel
22205	Quality Management of Food Processing	1/1	S	3	Schuchmann
22207	Food Science and Functionality	2	W	4	Watzl

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 overal grade of the module is the gradeof the general oral exam.

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.

Learning Outcomes

Content

Module: Specialization in Food Process Engineering [WI4INGCV4]

Coordination: Volker Gaukel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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	4	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

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 overal grade of the module is the gradeof the general oral exam.

Conditions
It is only possible to choose this module in combination with the module *Principles of Food Process Engineering* [WI4INGCV3].
The module is passed only after the final partial exam of *Principles of Food Process Engineering* is additionally passed.
The course *Quality Management of Food Processing* [22205] is obligatory and has to attended. Has it already been attended in the Bachelor programme, an other course has to be chosen instead.

Learning Outcomes

Content

Module: Water Chemistry [WI4INGCV5]

Coordination: F.H. Frimmel
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
18	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22601	Chemical Technology of Water	2/0	W	4	F. Frimmel
22602	Excercises in Chemical Technology of Water	1	W	2	F. Frimmel
22603	Scientific Bases for Examination and Assessement of Water Quality	2	W	4	F. Frimmel
22618	Fundamentals of Waste Water Treatment	2	S	4	n.N.
22612	Oxidation Processes in Drinking Water Technology	2	S	4	F. Frimmel
22611	Sorption Processes in Water Treatment	2	S	4	Höll
22605	Membrane Separation in Water Treatment	1	W	2	F. Frimmel
22664	Laboratory Work “Water”	2	W	4	F. Frimmel, Abbt-Braun

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 *Laboratory Work “Water”* [22664] ist prerequisited 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.

Conditions
The courses *Chemical Technology of Water* [22601] and *Excercises in Chemical Technology of Water* [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

Module: Understanding and Prediction of Disasters I [WI4INGINTER1]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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	F. Nestmann
19207		2/1	S	4.5	B. Lehmann
19207	River Engineering and Ecology I	2	W	3	S. 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	Environment Communication	2/1	S	3	Kämpf

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

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

Learning Outcomes
See German version.

Content
See German version.

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 [WI4INGINTER2]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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	F. Nestmann
19207		2/1	S	4.5	B. Lehmann
19207	River Engineering and Ecology I	2	W	3	S. 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	Environment Communication	2/1	S	3	Kämpf

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

Conditions
'Hydraulic Engineering and Water Ressource Management'[19055] can only be chosen within this module, if it has not yet been taken before (e.g., in the modules for bachelor students on Understanding and Prediction of Disasters).
It is only possible to choose this module in combination with the module *Understanding and Prediction of Disasters I*. The module is passed only after the final partial exam of *Understanding and Prediction of Disasters I* is additionally passed.

Learning Outcomes
See German version.

Content
See German version.

Remarks
In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Understanding and Prediction of Disasters I* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Understanding and Prediction of Disasters I* it is still possible to gain 18 credit points in total in the field of Understanding and Prediction of Disasters.

Module: Understanding and Prediction of Disasters III [WI4INGINTER3]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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	F. Nestmann
19207		2/1	S	4.5	B. Lehmann
19207	River Engineering and Ecology I	2	W	3	S. 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	Environment Communication	2/1	S	3	Kämpf

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

Conditions
'Hydraulic Engineering and Water Ressource Management'[19055] can only be chosen within this module, if it has not yet been taken before (e.g., in the modules for bachelor students on Understanding and Prediction of Disasters).
It is only possible to choose this module in combination with the module *Understanding and Prediction of Disasters II*. The module is passed only after the final partial exam of *Understanding and Prediction of Disasters II* is additionally passed.

Learning Outcomes
See German version.

Content
See German version.

Remarks
In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Understanding and Prediction of Disasters II* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Understanding and Prediction of Disasters I and II* it is still possible to gain 27 credit points in total in the field of Understanding and Prediction of Disasters.

Module: Safety Science I [WI4INGINTER4]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Emissions into the Environment	2/0	W	3.5	U. 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	1	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
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

Conditions
None.

Learning Outcomes
See German version.

Content
See German version.

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

Module: Safety Science II [WI4INGINTER5]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Emissions into the Environment	2/0	W	3.5	U. 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	1	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
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo

Learning Control / Examinations
The assessment is carried out as partial exams (according to Section 4(2), 1-3 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.

Conditions
It is only possible to choose this module in combination with the module *Safety Science I*. The module is passed only after the final partial exam of *Safety Science I* is additionally passed.

Learning Outcomes
See German version.

Content
See German version.

Remarks
In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Safety Science I* from winter term 2010/11 on. Students that already began the double module have been assigned to the two single modules.

Module: Safety Science III [WI4INGINTER6]

Coordination: Ute Werner
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25962	Emissions into the Environment	2/0	W	3.5	U. 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	1	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
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo

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

Conditions
It is only possible to choose this module in combination with the module *Safety Science II*. The module is passed only after the final partial exam of *Safety Science I* is additionally passed.

Learning Outcomes
See German version.

Content
See German version.

Remarks
In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.
The module is offered as an extension module to *Safety Science I and II* from winter term 2010/11 on. Students that already began the triple module have been assigned to the three single modules.

Module: Combustion Engines I [WI4INGMB18]

Coordination: Heiko Kubach
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21101	Combustion Engines A	4/2	W	9	Spicher

Learning Control / Examinations
The assessment of the module is carried out by a written examination about the lecture *Combustion Engines A* [21101] (according to Section 4(2), 1 of the examination regulation). The grade of the module corresponds to the grade of this examination.

Conditions
None.

Learning Outcomes

Content

Module: Combustion Engines II [WI4INGMB19]

Coordination: Heiko Kubach
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21135	Combustion Engines B	2/1	S	5	Spicher
21112	Supercharging of Internal Combustion Engines	2	S	4	Golloch
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
21134	Methods in Analyzing Internal Combustion	2	S	4	Wagner
21137	Engine Measurement Technologies	2	S	4	Bernhardt
21114	Simulation of Spray and Mixture Formation in Internal Combustion Engines	2	W	4	Baumgarten

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

Conditions
It is only possible to choose this module in combination with the module *Combustion Engines I* [WI4INGMB18]. The module is passed only after the final partial exam of *Combustion Engines I* is additionally passed.
The course *Combustion Engines B* [21135] has to be attended.

Recommendations
Basic skills in the subject of Thermodynamics are recommended.

Learning Outcomes

Content

Module: Manufacturing Engineering [WI4INGMB23]

Coordination: Volker Schulze
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149657	Manufacturing Engineering	4/1	W	9	V. Schulze

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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 the wbk. The term paper may not be convalidated in the seminar module.

Conditions
None.

Learning Outcomes

Content

Remarks
New module in winter term 2010/11.

Module: Integrated Production Planning [WI4INGMB24]

Coordination: Volker Schulze, Gisela Lanza
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2150660	Integrated Production Planning	4/2	S	9	Lanza, Gisela

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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 wbk. The term paper may not be convalidated in the seminar module.

Conditions
None.

Learning Outcomes

Content

Remarks
New module in winter term 2010/11.

Module: Specialization in Production Engineering [WI4INGMB22]

Coordination: Volker Schulze
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149667	Quality Management	2	W	4	Lanza, Gisela
2149669	Materials and Processes in Automotive Lightweight Construction	2	W	4	Haepp
2149900	Machine Tools and Industrial Handling I	2/1	W	4	Munzinger
2150681	Umformtechnik	2	S	4	Herlan
2150683	Steuerungstechnik	2	S	4	Gönnheimer
2149655	Verzahntechnik	2	W	4	Felten

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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 wbk. The term paper may not be convalidated in the seminar module.

Conditions
It is only possible to choose this module in combination with the module *Manufacturing Engineering* [WI4INGMB23] **or/and** *Integrated Production Planning* [WI4INGMB24]. The module is passed only after the final partial exam of one of the above modules is additionally passed.

Learning Outcomes

Content

Remarks
New module in winter term 2010/11.

Module: Material Flow in Logistic Systems [WW4INGMB25]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21051	Material Flow in Logistic Systems	3/1	W	6	K. Furmans
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21056	Airport Logistics	2	W	4	Richter
2118085	Automotive Logistics	2	S	4	K. Furmans

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 seperately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. 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. The term paper may not be convalidated in the seminar module.

Conditions
It is obligatory to choose the course *Material Flow in Logistic Systems.*

Learning Outcomes
The student

- acquires comprehensive and well-founded knowledge on the main topics of logistics, an overview of different logistic questions in practice and knows the functionality of material handling systems,
- is able to illustrate logistic systems with adequate accuracy by using simple models,
- is able to realize coherences within logistic systems,
- is able to evaluate logistic systems by using the learnt methods.

Content
The module *Material Flow in Logistic Systems* provides comprehensive and well-founded basics for the main topics of logistics. Within the lectures, the interaction between several components of logistic systems will be shown. The module focuses on technical characteristics of material handling systems as well as on methods for illustrating and evaluating logistics systems. To gain a deeper understanding, the course is accompanied by exercises and case studies.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WI4INGMB11].

Module: Material Flow in networked Logistics Systems [WW4INGMB26]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21060	Analytical Models for Material Flow	3/1	W	6	K. Furmans
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21056	Airport Logistics	2	W	4	Richter
2118085	Automotive Logistics	2	S	4	K. Furmans

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 seperately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal. 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. The term paper may not be convalidated in the seminar module.

Conditions
The module is passed only after the final partial exam of *Material Flow in Logistic Systems* [WW4INBMB25] is additionally passed.
The lecture *Analytical Models for Material Flow* has to be chosen.

Learning Outcomes
The student

- acquires in-depth knowledge on the main topics of logistics, gets an overview of different logistic questions in practice,
- is able to evaluate logistic systems by using the learnt methods,
- is able to analyze and explain the phenomena of industrial material and value streams.

Content
The module *Material Flow in networked Logistic Systems* provides in-depth basics for the main topics of logistics and industrial material and value streams. The obligatory lecture focuses on queuing methods to model production systems. To gain a deeper understanding, the course is accompanied by exercises.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WI4INGMB11].

Module: Technical Logistics [WW4INGMB27]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

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

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2117081		2/1	W	4	M. Mittwollen
2117082	Technical Logistics I, basics and systems	3/1	W	6 (ggf. kontextabhängig)	M. Mittwollen
2118081	Technical Logistics II, selected application examples	2/1	S	4	M. Mittwollen
2118086	Technical Logistics II, selected application examples plus project	3/1	S	6 (ggf. kontextabhängig)	M. Mittwollen
2118083	IT for Facility Logistics	3/1	S	6	Thomas
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21061	Safety Engineering	2	W	4	Kany
21064	Industrial Application of Technological Logistics instancing Crane Systems	2	W	4	Golder
2118089	Industrial Application of Material Handling Systems in Sorting and Distribution Systems	2	S	4	Föller
2117500	Energy efficient intralogistic systems	2	W	4	Schönung

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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. The term paper may not be convalidated in the seminar module.

Conditions
It is only possible to choose this module in combination with the module *Material Flow in Logistic Systems* [WW4INBMB25].
The module is passed only after the final partial exam of *Material Flow in Logistic Systems* is additionally passed.
The lecture *Technical Logistics I, basics* [2117081] *or Technical Logistics I, basics and systems* [2117082] has to be chosen.

Learning Outcomes
The student

- acquires well-founded knowledge on the main topics of technical logistics
- gets an overview of different applications of technical logistics in practice,
- acquires expertise and understanding about functionality of material handling systems.

Content
The module *Technical Logistics* provides in-depth basics on the main topics of technical logistics. The module focuses on technical characteristics of material handling technology. To gain a deeper understanding, the course is accompanied by exercises.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WI4INGMB11].

Module: Logistics in Value Chain Networks [WW4INGMB28]

Coordination: Kai Furmans
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2118078	Logistics - Organisation, Design, and Control of Logistic Systems	3/1	S	6	K. Furmans
21062	Supply Chain Management	3/1	W	6	Alicke
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo
2118097	Warehouse and Distribution Systems	2	S	4	Christian Huber
21056	Airport Logistics	2	W	4	Richter
2118085	Automotive Logistics	2	S	4	K. Furmans
2118094	Information Systems and Supply Chain Management	2	S	4	Kilger

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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. The term paper may not be convalidated in the seminar module.

Conditions
It is only possible to choose this module in combination with the module *Material Flow in Logistic Systems* [WW4INBMB25]. The module is passed only after the final partial exam of *Material Flow in Logistic Systems* is additionally passed.
One of the lectures

- *Logistics – Organization, Design and Control of Logistic Systems* [2118078]
- *Supply Chain Management* [21062]
- *Quantitative Methods for Supply Chain Risk Management* [2118090]

has to be chosen.

Learning Outcomes
The student

- is able to plan logistic systems and evaluate their performance,
- can use approaches of Supply Chain Management within the operational practice,
- identifies, analyses and evaluates risks within logistic systems.

Content
The module *Logistics in value chain networks* provides basics for the main topics of logistics. Within the lecture basic methods for planning and running logistic systems are introduced. Furthermore special issues like supply chain management and risks in logistic systems are focused. To gain a deeper understanding, the course is accompanied by exercises.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Technical Logistics and Logistic Systems* [WI4INGMB11].

Module: Virtual Engineering A [WW4INGMB29]

Coordination: Jivka Ovtcharova
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21352	Virtual Engineering I	2/3	W	6	J. Ovtcharova
21360	Virtual Engineering for Mechatronic Products	3/0	W	4	J. Ovtcharova, S. Rude
21364/21365	Product, Process and Ressource Integration in the Automotive Development	2/1	W/S	4	S. Mbang
21387	Computer Integrated Planning of New Products	2/0	S	4	R. Kläger
2122371	Efficient Creativity - Processes and Methods within the Automotive Industry	2	S	4	Lamberti

Learning Control / Examinations
The assessment of the module is carried out by an oral examination about the lectures *Virtual Engineering I* 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* (60 percent) and the other exam (40 percent).

Conditions
The course *Virtual Engineering I* [2121352] is compulsory modules and must be examined.

Learning Outcomes
The students:

- have basic knowledge about industrial practice of Information Technology in product emergence district,
- understand an actual and future use of Information systems in product emergence process in the context of Product Lifecycle Management and Virtual Engineering,
- will be able to work with current Cax- and PLM-systems in product emergence process

Content
This module arranges an integrative lifecycle-orientated consideration of products and processes. The global assignment of development, manufacture and distribution, as well as allotment the potential assignment of new immersive, interactive and intelligent technologies (Virtual Reality, Augmented Reality, Mixed Reality, Virtual Mock-Up) for function relevance of validation activities in context of entire products will be described.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Virtual Engineering* [WI4INGMB22].

Module: Virtual Engineering B [WW4INGMB30]

Coordination: Jivka Ovtcharova
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21378	Virtual Engineering II	2/1	S	4	
21360	Virtual Engineering for Mechatronic Products	3/0	W	4	J. Ovtcharova, S. Rude
21364/21365	Product, Process and Ressource Integration in the Automotive Development	2/1	W/S	4	S. Mbang
21387	Computer Integrated Planning of New Products	2/0	S	4	R. Kläger
2122371	Efficient Creativity - Processes and Methods within the Automotive Industry	2	S	4	Lamberti
2123375	Virtual Reality Practical Course	3	W	4	J. Ovtcharova

Learning Control / Examinations
The assessment of the module is carried out by an oral examination about the lectures *Virtual Engineering II* and an oral exam (ca. 30 min) or an exam any other kind about two other lectures (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* (33 percent) and the other exams (each owning 33 percent).

Conditions
The course *Virtual Engineering II* [2122378] is compulsory module and must be examined.

Recommendations
We recommend to attend/visit the courses *Engineering I* [2121352] before *Virtual Engineering II* [2122378]

Learning Outcomes
Englische Version:
The students:

- have basic knowledge about industrial practice of Information Technology in product emergence district,
- understand an actual and future use of Information systems in product emergence process in the context of Product Lifecycle Management and Virtual Engineering,
- will be able to work with current Cax- and PLM-systems in product emergence process

Content
This module arranges an integrative lifecycle-orientated consideration of products and processes. The global assignment of development, manufacture and distribution, as well as allotment the potential assignment of new immersive, interactive and intelligent technologies (Virtual Reality, Augmented Reality, Mixed Reality, Virtual Mock-Up) for function relevance of validation activities in context of entire products will be described.

Remarks
The module is first offered in winter term 2010/11 and replaces parts of *Virtual Engineering* [WI4INGMB22].

Module: Global Production and Logistics [WI4INGMB31]

Coordination: Volker Schulze, Gisela Lanza
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2149610	Global Production and Logistics - part 1: Global Production	2	W	4	Lanza
2149600	Global Production and Logistics - part 2: Global Logistics	2	S	4	K. Furmans
2118085	Automotive Logistics	2	S	4	K. Furmans
2118094	Information Systems and Supply Chain Management	2	S	4	Kilger
2149667	Quality Management	2	W	4	Lanza, Gisela
2150690	Production Systems and Production Technology in Major Assembly Production	2	S	4	Stauch
2149666		2	S	4	Weisbecker

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 seperately.
The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.
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 or the wbk. The term paper may not be convalidated in the seminar module.

Conditions
It is only possible to choose this module in combination with the module *Manufacturing Engineering* [WI4INGMB23] **or**/**and** *Integrated Production Planning* [WI4INGMB24] **or**/**and** *Logistics in Value Chain Networks* [WW4INGMB28]. The module is passed only after the final partial exam of one of the above modules is additionally passed.
It is obligatory to choose the lectures *Global Production and Logistics – part 1: Global Production* and *part 2: Global Logistics.*

Recommendations
The module should be combined with the module: *Logistic in Value Chain Networks* [WW4INGMB28] (in this case the module *Material flow in Logistic Systems* is not obligatory).

Learning Outcomes
The student

- acquires basic knowledge on the main topics of global production and logistics,
- will achieve a sound knowledge about planning and operations of global supply chains and will be able to use simple models for planning,
- will achieve a sound knowledge about planning global production networks

Content
The module Global Production and Logistics provides comprehensive and well-founded basics for the main topics of global production and logistics. The lectures aim to show opportunities and market conditions for global enterprises. Part 1 focuses on foreign trade theory, legal and economic backgrounds, opportunities and risks of international production. Part 2 focuses on the structure of international logistics, their modeling, design and analysis. The threats in international logistics are discussed in case studies.

Remarks
New module in winter term 2010/11.

Module: Unscheduled Engineering Module [WI4INGAPL]

Coordination: Prüfer einer Ingenieurwissenschaftlichen Fakultät
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Engineering Science

ECTS Credits	Cycle	Duration
9		

Learning Control / Examinations
The assessment of the module is determined by the respective module corrdinator. It can either be in the form of a general exam or partial exams, and must be contain at least 9 credit points and at least 6 hours per week. 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.

Conditions
None.

Learning Outcomes

Content

5.7 Law

Module: Commercial Law [WI4JURA2]

Coordination: Peter Sester
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	2

Courses in module

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

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

Conditions
None.

Learning Outcomes
The student

- possesses in-depth knowledge of the general and specific law of obligations and of property law;
- is able to penetrate the interaction of the statutory provisions of the German Civil Code (different types of contracts and the respective rules on liability; performance; impairment of performance; the different ways by which property may be transferred and the *in rem* security rights) and of commercial and company law (especially in respect of the peculiarities of commercial transactions, commercial agency, the law of merchants as well as German law of business organizations);
- in the Private Law Exercises (”Privatrechtliche Übung”) gains the skill to solve legal problems using legal methods.

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

Module: Intellectual Property Law [WI4JURA4]

Coordination: Thomas Dreier
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24812	Internet Law	2/0	S	3	T. Dreier
24121	Copyright	2/0	W	3	T. Dreier
24574	Patent Law	2/0	S	3	N.N.
24136/24609	Trademark and Unfair Competition Law	2/0	W/S	3	Y. Matz, P. Sester
24583	Computer Contract Law	2/0	S	3	M. Bartsch
24815		2/0	W/S	3	K. Melullis
24357		2	W	3	R. Reussner, M. Kuperberg, K. Melullis

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

Conditions
None.

Learning Outcomes

Content

Module: Private Business Law [WI4JURA5]

Coordination: Peter Sester
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
None.

Recommendations
For the courses

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

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

Learning Outcomes
The student

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

Content

Module: Public Business Law [WI4JURA6]

Coordination: Indra Spiecker genannt Döhmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Law

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

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

Conditions
None.

Learning Outcomes

Content

5.8 Sociology

Module: Sociology [WI4SOZ1]

Coordination: Gerd Nollmann
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject: Sociology

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

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

Learning Control / Examinations

Conditions
None.

Learning Outcomes
The student

- Gains theoretical and methodical knowledge of social processes and structures.
- Is able to apply his/her gained knowledge practically.
- Is able to present his/her work results in a precise and clear way.

Content
The module sociology offers students the possibility to get to know problems touching social phenomens and to answer these theoretically as well as empirically. For example: Who does earn how much in his job and why? How do subcultures emerge? Why are boys' grades in school always worse than those of girls? Do divorces have negative influences on the development of children? How does mass consumption influence the individual? Is there a world society emerging?

In addition the module contains courses on sociological methods that are essential to answer the above questions scientifically.

5.9 General Modules

Module: Seminar Module [WW4SEM]

Coordination: Marliese Uhrig-Homburg, Studiendekan (Fak. f. Wirtschaftswissenschaften)
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject:

ECTS Credits	Cycle	Duration
9	Every term	1

Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
SemAIFB1	Seminar in Enterprise Information Systems	2	W/S	3	R. Studer, A. Oberweis, T. Wolf, R. Kneuper
SemAIFB2	Seminar Efficient Algorithms	2	W/S	3	H. Schmeck
SemAIFB3	Seminar Complexity Management	2	W/S	3	D. Seese
SemAIFB4	Seminar Knowledge Management	2	W	3	R. Studer
26470	Seminar Service Science, Management & Engineering	2	W/S	3	S. Tai, C. Weinhardt, G. Satzger, R. Studer
25293	Seminar in Finance	2	W/S	3	M. Uhrig-Homburg, M. Ruckes
SemFBV1	Seminar in Insurance Management	2	W/S	3	U. Werner
SemFBV2	Seminar in Operational Risk Management	2	W/S	3	U. Werner
SemFBV3	Seminar in Risk Theory and Actuarial Science	2	W/S	3	C. Hipp
25915/25916	Seminar: Management and Organization	2	W/S	3	H. Lindstädt
25195	Master-Seminar Marketing Plannning	2	W/S	3	W. Gaul
25192	Master Seminar in Marketing	2	W/S	3	W. Gaul
25197		2	W	3	B. Neibecker
25194	Master Seminar in Quantitative Marketing and OR	2	W/S	3	W. Gaul
25193		2	W/S	3	W. Gaul
25196	Master Seminar in Entrepreneurship, Innovation and International Marketing	2	W/S	3	Gaul
SemIIP	Seminar in Ergonomics	2	W/S	3	P. Knauth, D. Karl
SemIIP2	Seminar in Industrial Production	2	W/S	3	F. Schultmann, M. Fröhling, M. Hiete
SemEW	Seminar Energy Economics	2	W/S	3	W. Fichtner, D. Möst, P. Jochem
26510	Master Seminar in Information Engineering and Management	2	W	3	A. Geyer-Schulz
SemIW	Seminar Information Engineering and Management	2	W/S	3	C. Weinhardt
26420	Topics of Sustainable Management of Housing and Real Estate	2	W/S	3	T. Lützkendorf
SemWIOR4	Seminar in Game and Decision Theory	2	W/S	3	S. Berninghaus
SemWIOR3	Seminar in Experimental Economics	2	W/S	3	S. Berninghaus
SemWIOR2	Seminar Economic Theory	2	W/S	3	C. Puppe
SemIWW2	Seminar in International Economy	2/0	W/S	3	J. Kowalski
26130	Seminar Public Finance	2	W/S	3	B. Wigger, Assistenten
26263	Seminar on Network Economics	2	W/S	3	K. Mitusch
25491	Seminar in Discrete Optimization	2	W/S	3	S. Nickel
25131	Seminar in Continous Optimization	2	W/S	3	O. Stein
SemWIOR1	Seminar Stochastic Models	2	W/S	3	K. Waldmann
SemING	Seminar in Engineering Science	2	W/S	3	Fachvertreter ingenieurwissenschaftlicher Fakultäten
SemIFL	Seminar Conveying Technology and Logistics	2	W/S	3	K. Furmans
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 Foreig Languages	2-4	W/S	2-4	House of Competence
HoC4	Elective “Tutor Programmes”	k.A.	W/S	2 / 3	House of Competence
HoC5	Elective “Personal Fitness & Emotional Competence”	k.A.	W/S	2-3	House of Competence
SemIWW3		2	W/S	3	I. Ott
21690sem	Seminar paper “Production Engineering”	2	W/S	3	V. Schulze, Lanza, Munzinger

Learning Control / Examinations
The modul examination consists of two seminars and of at least one key qualification (KQ) course (according to §4 (3), 3 of the examintaion regulation). 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 KQ courses are not included.

Conditions
The course specific preconditions must be observed.

- *Seminars*: Two seminars out of the course list, that have at least 3 CP each and are offered by a representative of the Faculty of Economics and Business Engineering, have to be chosen.
- Alternatively one of the two 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 department 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). This alternative seminar **requires an official approval** and can be applied at the examination office of the School of Economics and Business Engineering. Seminars at the institutes wbk and IFL do not require these approval.
- *Key Qualification (KQ)-course(s)*: One or more courses with at least 3 CP in total of additional key qualifications have to be chosen among the courses [HoC1-5]. More detailled information can be found at the course descriptions and on http://www.hoc.kit.edu/sq-wahlbereiche.

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.

Content
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 detailled description o these qualifications is given in the section “Key Qualifications” of the module handbook.
Furthermore, the module also includes additional key qualifications provided by the KQ-courses.

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 KIT. 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 [WI4THESIS]

Coordination: Der Vorsitzende des Prüfungsausschusses
Degree programme: Wirtschaftsingenieurwesen (M.Sc.)
Subject:

ECTS Credits	Cycle	Duration
30		

Learning Control / Examinations
The Master Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Business Enginieering. 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 examiner has to be involved in the degree programme. Involved in the degree programme are the persons that coordinate a module or a lecture of the degree programme.
The regular processing time takes six months. On a reasoned request of the student, the examination board can extend the processing time of a maximum of three 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 examinor 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 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.

Conditions
Prerequisite for admission to the Master thesis is that 50 percent of the credit points has to be completed.
A written confirmation of the examinor about supervising the Master Thesis is required.
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 examinor. The topic has to be related to Business and Engineering and has to refer to subject-specific or interdisciplinary problems.

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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 unvertretbar hohem Prüfungsaufwand kann eine schriftlich durchzuführende Prüfung auch mündlich oder eine mündlich durchzuführende Prüfung auch schriftlich abgenommen werden. Diese Änderung muss mindestens sechs Wochen vor der Prüfung bekannt gegeben werden.

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 Studierendem.

(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,

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 mit „nicht ausreichend" bewertet, es sei denn, dass der Studierende dieses Versäumnis nicht zu vertreten hat. § 8 gilt entsprechend.

(7) Die Masterarbeit wird von einem Betreuer sowie in der Regel von einem weiteren Prüfer 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.

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(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 **Gesamt: 120**

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