

## Business Engineering (B.Sc.)

Winter term 2010/2011

Short version

Date: 23.09.2010

Faculty of Economics and Business Engineering



Publisher:



**Fakultät für  
Wirtschaftswissenschaften**

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# 1 Structure of the Bachelor Programme in Business Engineering (B.Sc.)

The bachelor programme in Business Engineering (B.Sc.) has 6 terms and consists of 180 credits (CP) including internship and bachelor thesis. The terms 1 to 3 of the programme are methodologically oriented and provide the student with the foundations of business, economic and engineering science. Terms 4 to 6 aim at the specialization and application of this knowledge.

Figure 1 shows the structure of the subjects and the credits (CP) allocated to the subjects. According to the European Credit Transfer System, one credit corresponds to a workload of 30 hours.

Business Engineering (B.Sc.)								
Semester	Core Programme							
Subject	BA	EC	INFO	OR	ENG	MATH	STAT	
1	Acc 4 CP	EC 1 5 CP	Progr 5 CP		Material Science 2,5 CP	Math 1 7 CP		
	BAA 3 CP				Mass and Energy Bal. 2,5 CP			
2	BAB 4 CP	EC 2 5 CP	Info 1 5 CP	OR 1 4,5 CP		Math 2 7 CP	Stat 1 5 CP	
	BAC 4 CP							Eng. Mechanics 2,5 CP
3			Info 2 5 CP	OR 2 4,5 CP	Electr. Eng 2,5 CP	Math 3 7 CP	Stat 2 5 CP	
	Internship 8 CP							
Specialization Programme								
4	Compulsory						Elective	
	BA	EC	INFO	OR	ING	Seminar + KS	BA/ENG	Elective
5	9 CP	9 CP	9 CP	9 CP	9 CP	6 + 3 CP	9 CP	9 CP
6	Bachelor Thesis 12 CP							
	182 CP (Core Programme + Specialization Programme + Bachelorarbeit)							

Figure 1: Structure of the Bachelor Programme(Recommendation)

In the specialization studies of the third year of the bachelor programme the student has to choose one elective module of the following disciplines: Informatics, operations research, business science, economics, engineering science, statistics, law and sociology. 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.

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 follow the proposed structure and schedule of the first 3 terms and to complete all courses and seminars before beginning the bachelor thesis.

## 2 Key Skills

The bachelor programme Business Engineering (B.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, tutor programs with more than 20 semester periods per week contribute significantly to the development of key skills in the bachelor programme. 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

### Enabling skills

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

### Orientalional knowledge

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

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

1. Basic programme in economics and business science
2. Seminar module
3. Mentoring of the bachelor thesis
4. Internship
5. Business science, economics and informatics modules

Figure 2 shows the classification of key skills within the bachelor programme 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.

Bachelorstudium							
Art der Schlüsselqualifikation	Grundprogramm			Vertiefungsprogramm			
	REWE BWL A	BWL B,C VWL I,II	Tutoren- programm	BWL, VWL, INFO	Seminar	Bachelor- arbeit	Betriebs- praktikum
<b>Basiskompetenzen (soft skills)</b>							
Teamarbeit, soziale Kommunikation und Kreativitätstechniken		x	x				
Präsentationserstellung und -techniken			x		x		
Logisches und systematisches Argumentieren und Schreiben					x	x	
Strukturierte Problemlösung und Kommunikation					x	x	
<b>Praxisorientierung (enabling skills)</b>							
Handlungskompetenz im beruflichen Kontext							x
Kompetenzen im Projektmanagement							x
Betriebswirtschaftliche Grundkenntnisse	x						
Englisch als Fachsprache				x			(x)*
<b>Orientierungswissen</b>							
Interdisziplinäres Wissen		x		x	x	(x)*	(x)*
Institutionelles Wissen über Wirtschafts- und Rechtssysteme		x		x			
Wissen über internationale Organisationen		x		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 Bachelorarbeit)

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

#### Begin and completion of a module

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

#### General exams and partial exams

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

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

For further and more detailed information also see [https://zvwgate.zvw.uni-karlsruhe.de/download/leitfaden\\_studierende.pdf](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	exercise course	Übung
V	lecture	Vorlesung
W	winter term	Wintersemester

## 4 Actual Changes

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

### WI3BWLFBV3 - Risk and Insurance Management (S. 28)

#### Anmerkungen

The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in winter term 2010/11.

### WI3BWLFBV4 - Insurance Markets and Management (S. 29)

#### Anmerkungen

The course *Insurance Marketing* [26323] is offered in winter term 2010/11 and is held by Dr. Edmund Schwake. Furthermore the course is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>  
This module was formerly named *Insurance Management*.

### WI3VWL1 - Applied Game Theory (S. 41)

#### Anmerkungen

See german version.  
The lecture *Competition in Networks* [26240] was included in this module in winter term 2010/11.

### WI3VWL6 - Microeconomic Theory (S. 44)

#### Anmerkungen

The lecture *Competition in Networks* [26240] was included in this module.

### WI3VWL9 - Public Finance (S. 46)

#### Anmerkungen

The course *Finanzpolitik* [26122] has been replaced with the course *Spezielle Steuerlehre* [26129] since winter term 2010/11. The examination will be offered latest until summer term 2011 (repeaters only).

### WI3OR6 - Methodical Foundations of OR (S. 51)

#### Anmerkungen

The planned lectures and courses for the next three years are announced online (<http://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.

### WI3INGMB13 - Introduction to Technical Logistics (S. 53)

#### 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].  
The course [21692] *Internationale Produktion und Logistik* is not offered here anymore.  
Examinations for the canceled courses will be offered latest until summer term 2011.

### WI3INGETIT1 - Electrical Power Engineering (S. 66)

#### Anmerkungen

The course *Power Network Analysis* was formerly known as *Electric Power System Engineering I*.  
The course *Diagnostics on Power Network Equipment* [23365] is not offered any more. Exams can still be taken until summer term 2011. Please contact the institute.

### WI3INGETIT2 - Control Engineering (S. 67)

#### Anmerkungen

The cycle for the lecture *System Dynamics and Control Engineering* [23155] has been changed from winterterm into summerterm.

### WI3INGINTER2 - Understanding and Prediction of Disasters II (S. 72)

#### 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.

### **WI3INGINTER5 - Understanding and Prediction of Disasters III (S. 73)**

#### **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.

### **WI3INGINTER3 - Safety Science I (S. 74)**

#### **Anmerkungen**

In agreement with the coordinator of the module other suitable courses than the ones displayed can be taken.  
From the winter term 2010/2011 on, the lecture *Safety Engineering* has 3 credit points.

### **WI3INGINTER4 - Safety Science II (S. 75)**

#### **Anmerkungen**

From the winter term 2010/2011 on, the lecture *Safety Engineering* has 3 credit points.  
The module is offered as an extension module to *Safety Science I* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Safety Science I* it is still possible to gain 18 credit points in total in the field of safety sciences.

### **WI3INGMB23 - Manufacturing Engineering (S. 78)**

#### **Anmerkungen**

New module in winter term 2010/11.

### **WI3INGMB24 - Integrated Production Planning (S. 79)**

#### **Anmerkungen**

New module in winter term 2010/11.

### **WI3INGMB22 - Specialization in Production Engineering (S. 80)**

#### **Anmerkungen**

New module in winter term 2010/11.

## 5 Modules (Foundation)

### 5.1 All Subjects

#### Module: Business Administration [WI1BWL]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
15	Every term	2

#### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25002/25003	Financial Accounting and Cost Accounting	2/2	W	4	T. Burdelski
25023	Business Administration and Management Science A	2	W	3	T. Burdelski
25024/25025	Business Administration and Management Science B	2/0/2	S	4	W. Gaul, T. Lützkendorf, A. Geyer-Schulz, C. Weinhardt, T. Burdelski
25026/25027	Business Administration and Management Science C	2/0/2	W	4	H. Lindstädt, M. Ruckes, M. Uhrig-Homburg, T. Burdelski

#### 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. The examinations take place at the beginning of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures of each course of this module is defined for each course separately. The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

#### Conditions

None.

#### Recommendations

It is strongly recommended to attend the courses in the following sequence:

1st term: *Financial Accounting and Cost Accounting* [25002/25003] and *Business Administration and Management Science A* [25023]

2nd term: *Business Administration and Management Science B* [25024/25025]

3rd term: *Business Administration and Management Science C* [25026/25027]

#### Learning Outcomes

The student

- has core skills in business administration in particular with respect to decision making and model based view of corporations
- masters the fundamentals of managerial and financial accounting as well as business administration
- is able to analyse and assess the central tasks, functions and decisions in modern corporations

This module sets the base for advanced courses in the field of business administration and management science.

#### Content

This module provides the fundamentals of managerial and financial accounting as well as business administration and management science. Then, the module focuses on the fields of marketing, production economics, information engineering and management, management and organization, investment and finance and the german specific term controlling.

**Module: Economics [WI1VWL]**

**Coordination:** Siegfried Berninghaus  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Economics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
10	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25012	Economics I: Microeconomics	3/0/2	W	5	S. Berninghaus
25014	Economics II: Macroeconomics	3/0/2	S	5	B. Wigger

**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. The assessment procedures of each course of this module is defined for each course 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.

**Notice:** The lecture *Economics I: Microeconomics* [25012] is part of the preliminary examination concerning § 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

**Conditions**

None.

**Learning Outcomes**

The student

- knows and understands economic problems,
- understands economic policy in globalized markets,
- is able to develop elementary solution concepts.

The lectures of this module have different focuses: In Economics I economic problems are seen as decision problems, Economics II looks at the dynamics of economic processes.

**Content**

**Module: Introduction to Informatics [WI1INFO]**

**Coordination:** Hartmut Schmeck, Rudi Studer, Detlef Seese  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Informatics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
15	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25030	Introduction to Programming with Java	3/1/2	W	5	D. Seese
25074	Foundations of Informatics I	2/2	S	5	R. Studer, S. Rudolph
25076	Foundations of Informatics II	3/1	W	5	H. Schmeck

**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.

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

- Introduction to Programming with Java  
Compulsory tests in the computer lab  
Written exam resp. computer-based exam (120 min)  
The successful completion of the compulsory tests in the computer lab is prerequisites for admission to the written resp. computer-based exam.  
Those admission to the exam is only valid for the current main exam (in winter term) and the following exam (in summer term)
- Foundations of Informatics I  
Written exam in the first week of the recess period (60 min)
- Foundations of Informatics II  
Written exam in the first week of the recess period (90 min)  
It is possible to gain 0,3-0.4 grading points to the written exam by successful participation in the exercises (achieving a minimum number of points received for solutions to the exercises), or by successful completion of a bonus exam (both according to Section 4 (2), 3 of the examination regulation).

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**

None.

**Recommendations**

It is strongly recommended to attend the courses in the following sequence: *Introduction to Programming with Java* [25030], *Foundations of Informatics I* [25074] *Foundations of Informatics II* [25076]

**Learning Outcomes**

The student

- knows the main principles, methods and systems of computer science,
- can use this knowledge for applications in advanced computer science courses and other areas for situation-adequate problem solving,
- is capable of finding strategic and creative responses in the search for solutions to well defined, concrete, and abstract problems.

The student can deepen the learned concepts, methods, and systems of computer science in advanced computer science lectures.

**Content**

**Module: Introduction to Operations Research [WI1OR]**

**Coordination:** Stefan Nickel, Oliver Stein, Karl-Heinz Waldmann  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Operations Research

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer Term	2

**Courses in module**

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

**Learning Control / Examinations**

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

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

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

**Conditions**

None.

**Recommendations**

Mathematics I und II. Programming knowledge for computing exercises.

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

**Learning Outcomes**

The student

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

**Content**

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

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

## Module: Mass and Energy Balances for Reacting Systems [WI1ING1]

**Coordination:** Peter Pfeifer  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Engineering Science

<b>ECTS Credits</b> 2,5	<b>Cycle</b> Every 2nd term, Winter Term	<b>Duration</b> 1
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### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22130	Mass and Energy Balances for Reacting Systems	2/0	W	2.5	A. Kruse, P. Pfeifer

### Learning Control / Examinations

The assessment is carried out by a written exam about the lecture *Mass and Energy Balances for Reacting Systems* [22130] (according §4(2), 1 of the examination regulation).

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

### Conditions

None.

### Learning Outcomes

The student

- knows and understands energy and mass balances and the analysis of balance envelopes,
- can apply energy and mass balances on selected systems and processes,
- knows the problems, methods and processes of process engineering.

### Content

- Aims and approaches
- Mass balance
- Water
- Nitrogen and ammonia
- Energy balance
- Natural gas
- Carbon dioxide



**Module: Material Science [WI1ING2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
2,5	Every 2nd term, Winter Term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21760	Material Science I	2/1	W	2.5	M. Hoffmann

**Learning Control / Examinations**

The assessment of the module is carried out by a written examination (150 min) about the lecture *Material Science I* [21760] (according to Section 4(2), 1 of the examination regulation). The assessment procedures of each course of this module is defined for each course separately.

The examination is offered every semester. Re-examinations are offered at every ordinary examination date. The examination at the end of the summer term is carried out by a written or oral exam.

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

**Conditions**

None.

**Learning Outcomes**

The student

- knows and understands the correlation between atomic structure, microstructure and related macroscopic properties (e.g. mechanical or electrical behaviour)
- has basic knowledge on materials development and characterization

**Content**

- Atomic structure and interatomic bonding
- Structure of crystalline solids
- Imperfections in solids
- Mechanical behaviour
- Physical properties
- Solidification
- Thermodynamics of heterogeneous systems
- Phase diagrams
- Ferrous alloys

**Module: Engineering Mechanics [WI1ING3]**

**Coordination:** Carsten Proppe  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Engineering Science

<b>ECTS Credits</b> 2.5	<b>Cycle</b> Every 2nd term, Winter Term	<b>Duration</b> 1
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**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21208	Engineering Mechanics I	1/0.5	W	2.5	C. Proppe

**Learning Control / Examinations**

The assessment of the module is carried out by a written examination about the lecture *Engineering Mechanics* [21208] (according to Section 4(2), 1 of the examination regulation). The assessment procedures of each course of this module is defined for each course separately.

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

**Conditions**

None.

**Learning Outcomes**

The student

- knows and understands the basic elements of statics,
- is able to solve basic problems in statics independently.

**Content**

Statics: force • moment • general equilibrium conditions • center of gravity • inner forces in structure • plane frameworks • adhesion

**Module: Electrical Engineering [W11ING4]**

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

<b>ECTS Credits</b> 2,5	<b>Cycle</b> Every 2nd term, Winter Term	<b>Duration</b> 1
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**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23223	Electrical Engineering I	2/2	W	2.5	W. Menesklou

**Learning Control / Examinations**

The assessment of the module is carried out by a written examination about the lecture *Electrical Engineering I* [23223] (according to Section 4(2), 1 of the examination regulation). The assessment procedures of each course of this module is defined for each course separately.

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

**Conditions**

None.

**Learning Outcomes**

The student knows and understands basic terms of electrical engineering and should be able to carry out simple calculations of DC and AC circuits.

**Content**

Supporting the lecture, assignments to the curriculum are distributed. These are solved into additional (voluntary) tutorials.

**Module: Mathematics [WI1MATH]**

**Coordination:** Günter Last  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Mathematics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
21	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
01350	Mathematics I	4/2/2	W	7	G. Last, Folkers, Klar
01830	Mathematics II	4/2/2	S	7	G. Last, Folkers, Klar
01352	Mathematics III	4/2/2	W	7	G. Last, Folkers, Klar

**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.

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

The assessment procedures of each course of this module is defined for each course separately.

**Conditions**

The admission to the examinations carried out regardless of the evidence of the other examinations in the module.

It is strongly recommended to attend the courses in the following sequence: *Mathematics I* [01350], *Mathematics II* [01830] *Mathematics III* [01352]

**Learning Outcomes****Content**

**Module: Statistics [W1STAT]**

**Coordination:** Svetlozar Rachev, Markus Höchstötter  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Statistics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
10	Every term	2

**Courses in module**

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

**Learning Control / Examinations**

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

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

**Conditions**

**Notice:** The lecture *Statistics I* [25008/25009] is part of the preliminary examination concerning Section 8(1) of the examination regulation. This examination must be passed until the end of the examination period of the second semester. Any Re-examinations has to be passed until the end of the examination period of the third semester. Otherwise the examination claim will be lost.

**Recommendations**

To some extend knowledge of the content of the module Mathematics [WW1MATH/W11MATH] is assumed. Therefore it is recommended to attend the course *Mathematics 1* [01350] before attending the module *Statistics* [W1STAT].

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

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

**Learning Outcomes****Content**

The module contains the fundamental methods and scopes of Statistics.

A. Descriptive Statistics: univariate und bivariate analysis

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

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

## 6 Modules (Specialization)

### 6.1 Business Administration

#### Module: Foundations of Marketing [WI3BWL MAR]

**Coordination:** Wolfgang Gaul, Bruno Neibecker  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Business Administration

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

#### Courses in module

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

#### Learning Control / Examinations

The assessment consists of a general written exam according to §4 Abs. 2, Nr. 1 of examination regulation. The written exam has a duration of 120 min. and contains topics from the main lecture [25150] as well as from the chosen lectures [25154], [25156], [25177]. The examination is offered every semester. Re-examinations are offered at every ordinary examination date and has to be absolved within one year.

The overall grade for the module is the average of the grades for each course weighted by the credits of the course.

It is recommended, to attend more lectures than required to fulfill 9 CP as it is possible to examine in these additional lectures and influence the final grade positively.

#### Conditions

Successful completion of the module *Business Administration* [WI1BWL].

#### Learning Outcomes

#### Content

**Module: Strategy and Organization [WI3BWL01]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

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

**Learning Control / Examinations**

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

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL]. For exceptions see remarks below.

**Learning Outcomes****Content****Remarks**

See German version.

**Module: Industrial Production I [WI3BWLIIIP]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

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

**Learning Control / Examinations**

The module contains "Fundamentals of Production Management" [25950] and one optional course. The examination will be in form of individual written exams acc. to §4(2), 1 ER. 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. Assessment procedures are described separately for each course of the module.

**Conditions**

*Specific precondition for "Business Engineering" (B.Sc.) and "Economics Engineering" (B.Sc.):* Successful passing of the module "Business Administration" [WI1BWL]. For exceptions see remarks below.

The course "Fundamentals of Production Management" [25950] and one additional activity have to be chosen.

**Recommendations**

All courses are specifically designed to be taken independently.

Bearing in mind the master programme, we recommend combining this module with "Industrial Production II" [WW4BWLIIIP2] and/or "Industrial Production III" [WW4BWLIIIP6].

**Learning Outcomes**

- Students shall be aware of the important role of industrial production and logistics for production management.
- Students shall use relevant concepts of production management and logistics in an adequate manner.
- Students shall be able to reflect on decision principles in firms and their circumstances in the light of the production management aspects studied.
- Students shall be proficient in describing essential tasks, difficulties and solutions to problems in production management and logistics
- Students shall be able to describe relevant approaches of modeling production and logistic systems.
- Students shall be aware of the important role of material and energy-flows in production systems.
- Students shall be proficient in using exemplary methods for solving selected problems.

**Content**

This module is designed to introduce students into the wide area of industrial production and logistics management. It focuses on strategic production management under the aspect of sustainability. The courses use interdisciplinary approaches of systems theory to describe the central tasks of industrial production management and logistics. Herein, attention is drawn upon strategic corporate planning, research and development as well as site selection. Students will obtain knowledge in solving internal and external transport and storage problems with respect to supply chain management and disposal logistics.

**Remarks**

See German version.



**Module: Energy Economics [WI3BWLIP2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

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

**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) about the lecture *Introduction in to Energy Economics* [26010] and one optional lecture of the module. The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].  
 For exceptions see remarks below.

**Learning Outcomes****Content**

*Introduction to Energy Economics*  
*Renewable Energies*  
*Energy Policy*

**Remarks**

See German version.

**Module: Essentials of Finance [WI3BWLFBV1]**

**Coordination:** Marliese Uhrig-Homburg, Martin E. Ruckes  
**Degree programme:** Wirtschaftsingenieurwesen (B.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)
26575	Investments	2/1	S	4.5	M. Uhrig-Homburg
25216	Financial Management	2/1	S	4.5	M. Ruckes

**Learning Control / Examinations**

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

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

The student

- has fundamental skills in modern finance
- has fundamental skills to support investment decisions on stock, bond and derivative markets
- applies concrete models to assess investment decisions on financial markets as well as corporate investment and financing decisions.

**Content**

The module *Essentials of Finance* deals with fundamental issues in modern finance. The courses discuss fundamentals of the valuation of stocks. A further focus of this module is on modern portfolio theory and analytical methods of capital budgeting and corporate finance.

**Module: Insurance: Calculation and Control [WI3BWLFBV2]**

**Coordination:** Christian Hipp  
**Degree programme:** Wirtschaftsingenieurwesen (B.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)
26300	Insurance Models	2/2	S	5	C. Hipp, N.N.
26372	Insurance Game	2	S	4	C. Hipp, N.N.

**Learning Control / Examinations**

The assessment is carried out as a general written exam (according to Section 4(2), 1 of the examination regulation). In the lecture *Insurance Game* [26372] there has to be hold an oral presentation by each student as well (according to Section 4(2), 3 of the examination regulation). The examinations are offered every semester. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module separately.

The overall grade of the module consists of the grade of the written exam [80 percent) and the grade of the oral presentation (20 percent).

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes****Content**

**Module: Risk and Insurance Management [WI3BWLFBV3]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

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

**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4 (2), 1-3 SPO) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The lectures are examined by oral presentations and related term papers in the context of the lectures. Furthermore, there is a final oral examination.

The grade of each examination consists of the oral presentation and the term paper (50 percent) and the oral examination (50 percent). The overall grade of the module is the average of the grades for each course weighted by the credits and truncated after the first decimal.

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

See German version.

**Content**

See German version.

**Remarks**

The course *Enterprise Risk Management* [26326] is held by Dr. Edmund Schwake in winter term 2010/11.

**Module: Insurance Markets and Management [WI3BWLFBV4]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25055	Principles of Insurance Management	3/0	S	4.5	U. Werner
26323	Insurance Marketing	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
26353	International Risk Transfer	2/0	S	2.5	W. Schwehr

**Learning Control / Examinations**

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

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

See German version.

**Content**

See German version.

**Remarks**

The course *Insurance Marketing* [26323] is offered in winter term 2010/11 and is held by Dr. Edmund Schwake. Furthermore the course is offered irregularly. For further information, see: <http://insurance.fbv.uni-karlsruhe.de>

This module was formerly named *Insurance Management*.

**Module: Topics in Finance I [WI3BWLFBV5]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25210	Management Accounting	2/1	S	4.5	T. Lüdecke
25232	Financial Intermediation	3	W	4.5	M. Ruckes
26550	Derivatives	2/1	S	4.5	M. Uhrig-Homburg
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
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4.5	C. Weinhardt, R. Riordan
26129	Specific Aspects in Taxation	3	W	4,5	B. Wigger, A. Presse

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

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

It is only possible to choose this module in combination with the module *Essentials in Finance* [WI3BWLFBV1]. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance II* [WI3BWLFBV6]. In this case only those courses are electable, that have not been chosen in the module *Topics in Finance II* [WI3BWLFBV6] yet.

**Learning Outcomes**

The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

**Content**

The module *Topics in Finance I* is based on the module *Essentials of Finance*. The courses deal with advanced issues concerning the fields of finance and accounting, financial markets and banking from a theoretical and practical point of view.

**Module: Topics in Finance II [WI3BWLFBV6]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25210	Management Accounting	2/1	S	4.5	T. Lüdecke
25232	Financial Intermediation	3	W	4.5	M. Ruckes
26550	Derivatives	2/1	S	4.5	M. Uhrig-Homburg
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
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4.5	C. Weinhardt, R. Riordan
26129	Specific Aspects in Taxation	3	W	4,5	B. Wigger, A. Presse

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

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

It is only possible to choose this module in combination with the module *Essentials in Finance* [WI3BWLFBV1]. The module is passed only after the final partial exam of *Essentials in Finance* is additionally passed.

In addition to that it is possible to choose the module *Topics in Finance I* [WI3BWLFBV5]. In this case only those courses are electable, that have not been chosen in the module *Topics in Finance I* [WI3BWLFBV5] yet.

**Learning Outcomes**

The student

- has advanced skills in modern finance
- is able to apply these skills in practice in the fields of finance and accounting, financial markets and banking

**Content**

## Module: eBusiness and Servicemanagement [WI3BWLISM1]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26466	eServices	2/1	S	5	C. Weinhardt, G. Satzger
26452	Management of Business Networks	2/1	W	4.5	C. Weinhardt, J. Kraemer
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4.5	C. Weinhardt, R. Riordan
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

Successful completion of the module *Business Administration* [WI1BWL].

### Learning Outcomes

The students

- understand the strategic and operative design of information and information products,
- analyze the role of information on markets,
- evaluate case studies regarding information products,
- develop solutions in teams.

### Content

This module gives an overview of the mutual dependencies of strategic management and information systems. The central role of information is exemplified by the structuring concept of the *information life cycle*. The single phases of this life cycle from generation over allocation until dissemination and use of the information are analyzed from a business and microeconomic perspective, applying classical and new theories. The state of the art of economic theory on aspects of the information life cycle are presented. The lecture is complemented by exercise courses.

The courses "Management of Business Networks", "eFinance: Information engineering and management in finance" and "eServices" constitute three different application domains in which the basic principles of the Internet Economy are deepened. In the course "Management of Business Networks" the focus is set on the strategic aspects of management and information systems. It is held in English and teaches parts of the syllabus with the support of a case study elaborated with Prof Kersten from Concordia University, Montreal, Canada. If it is possible to organize, depending on the start of term in Canada, the case study will be worked on by the students via internet in collaboration with Canadian students. The results will jointly be presented in a telephone conference.

The course "eFinance: information engineering and management for securities trading provides theoretically profound and also practical-oriented background about the functioning of international financial markets. The focus is placed on the economic and technical design of markets as information processing systems.

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

The theoretic fundamentals of Information Engineering and Management can be enriched by a practical experience in Special Topics in Information Engineering and Management. Any practical Seminar at the IM can be chosen for the course Special Topics in Information Engineering and Management.



**Module: Supply Chain Management [WI3BWLISM2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26452	Management of Business Networks	2/1	W	4.5	C. Weinhardt, J. Kraemer
26496	Management of Business Networks (Introduction)		W	3	C. Weinhardt, J. Kraemer
25486	Facility Location and Strategic Supply Chain Management	2/1	S	4.5	S. Nickel
2118078	Logistics - Organisation, Design, and Control of Logistic Systems	3/1	S	6	K. Furmans
2118090	Quantitative Methods for Supply Chain Risk Management	3/1	S	6	Cardeneo
25488	Tactical and Operational Supply Chain Management	2/1	W	4.5	S. Nickel

**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**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

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

**Content**

The module "Supply Chain Management" gives an overview of the mutual dependencies of information systems and of supply chains spanning several enterprises. The specifics of supply chains and their information needs set new requirements for the operational information management. In the core lecture "Management of Business Networks" the focus is set on the strategic aspects of management and information systems. The course is held in English and teaches parts of the syllabus with the support of a case study elaborated with Prof Kersten from Concordia University, Montreal, Canada. The course MBN introduction is consisting out of the first part of the regular MBN lecture, but as it has less credits will not include the analysis of the case study.

The module is completed by an elective course addressing appropriate optimization methods for the Supply Chain Management and for modern logistic approaches.

**Remarks**

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: <http://www.iism.kit.edu/im/lehre>

**Module: eFinance [WI3BWLISM3]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26454	eFinance: Information Engineering and Management for Securities Trading	2/1	W	4.5	C. Weinhardt, R. Riordan
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
26550	Derivatives	2/1	S	4.5	M. Uhrig-Homburg
25296	Exchanges	1	S	1.5	J. Franke
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 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**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

In the module "eFinance: Information engineering and management in finance" the students get an overview of modern approaches of information management in the finance sector. They learn to analyze specific financial problems from the point of view of information management and also to solve these problems by using the tools provided by information management. By doing so, they get to know finance products as information products and learn the state of the art of modern information processing in the finance sector.

**Content**

The module "eFinance: Information engineering and management in finance" addresses current problems in the finance sector. It is investigated the role of information and knowledge in the finance sector and how information systems can solve or extenuate them. Speakers from practice will contribute to lectures with their broad knowledge. Core courses of the module deal with the background of banks and insurance companies and the electronic commerce of stocks in global finance markets. In addition the course Derivatives offers an insight into future and forward contracts as well as the assesment of options. Exchanges and International Finance are also alternatives which provide a supplementary understanding for capital markets.

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

**Remarks**

The current seminar courses for this semester, which are complementary to this module, are listed on following webpage: the <http://www.iism.kit.edu/im/lehre>

**Module: CRM and Service Management [WI3BWLISM4]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
26522	Analytical CRM	2/1	S	4.5	A. Geyer-Schulz
26520	Operative CRM	2/1	W	4.5	A. Geyer-Schulz

**Learning Control / Examinations**

The assessment is carried out as partial exams (according to Section 4(2) of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Thereby every lecture is examined by a written exam (according to Section 4(2), 1 of the examination regulation) and by successful completion of exercises (according to Section 4 (2), 3 of the examination regulation).

The grades of the individual lectures consists of the grade of the written exam (approximately 90 percent resp. 100 of 112 points) and of the exercise performance (approximately 10 percent resp. 12 of 112 points). In the case of passing the written exam (50 points) the points of the exercise performance will be added to the points of the written exam. The assessment procedures are described for each course of the module separately.

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

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes**

The student

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

**Content**

In the module *CRM and Service Management* [WI3BWLISM4] we teach the principles of modern customer-oriented management and its support by system architectures and CRM software packages. Choosing customer relationship management as a company's strategy requires service management and a strict implementation of service management in all parts of the company. For operative CRM we present the design of customer-oriented, IT-supported business processes based on business process modelling and we explain these processes in concrete application scenarios (e.g. marketing campaign management, call center management, sales force management, field services, ...).

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

**Remarks**

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

## Module: Specialization in Customer Relationship Management [WI3BWLISM5]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26522	Analytical CRM	2/1	S	4.5	A. Geyer-Schulz
26520	Operative CRM	2/1	W	4.5	A. Geyer-Schulz
25158	Corporate Planning and Operations Research	2/1	W	4.5	W. Gaul
26240	Competition in Networks	2/1	W	4.5	K. Mitusch
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 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

- Successful completion of the module *Business Administration* [WI1BWL] is required.
- It is only possible to choose this module in combination with the module *CRM and Servicemanagement* [WI3BWLISM4]. The module is passed only after the final partial exam of *CRM and Servicemanagement* is additionally passed.
- Or the course *Analytic CRM* [26522] or the course *Operative CRM* [26520] has to be taken.

### Learning Outcomes

The student

- knows the scientific methods (from business administration, statistics, informatics) which are most relevant for analytic CRM and he autonomously applies these methods to standard cases,
- gains an overview of the market for CRM software,
- designs, implements, and analyzes operative CRM processes in concrete application domains (e.g. campaign management, call center management, ...),
- is aware of the problems of protecting the privacy of customers and the implications of privacy law.

### Content

In this module, analysis methods and techniques for the management and improvement of customer relations are presented. Furthermore, modelling, implementation, introduction, change, analysis and valuation of operative CRM processes are treated. Regarding the first part, we teach analysis methods and techniques suitable for the management and improvement of customer relations. For this goal we treat the principles of customer- and service-oriented management as the foundation of successful customer relationship management. In addition, we show how knowledge of the customer can be used for decision-making at an aggregate level (e.g. planning of assortments, analysis of customer loyalty, ...). A basic requirement for this is the integration and collection of data from operative processes in a suitably defined data-warehouse in which all relevant data is kept for future analysis. The process of transferring data from the operative systems into the data warehouse is known as the ETL process (Extraction / Translation / Loading). The process of modelling a data-warehouse as well as the so-called extraction, translation, and loading process for building and maintaining a data-warehouse are discussed in-depth. The data-warehouse serves as a base for flexible management reporting. In addition, various statistic methods (e.g. cluster analysis, regression analysis, stochastic models, ...) are presented which help in computing suitable key performance indicators or which support decision-making.

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

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

**Module: Sustainable Construction [WI3BWLOOW1]**

**Coordination:** Thomas Lützkendorf  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Business Administration

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Winter Term	2

**Courses in module**

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

**Learning Control / Examinations**

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

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

It is possible to include the grade of a seminar paper, dealing with a topic from the area of sustainable construction, into the final grade of the module (according to Section 4(2), 3 of the examination regulation). The seminar has a weight of 20 percent.

**Conditions**

Successful completion of the module *Business Administration* [W11BWL].

**Recommendations**

The combination with the module *Real Estate Management* [WI3BWLOOW2] is recommended. Furthermore a combination with courses in the area of

- Industrial production (energy flow in the economy, energy politics, emissions)
- Civil engineering and architecture (building physics, building construction)

is recommended.

**Learning Outcomes**

The student

- knows the basics of sustainable design, construction and operation of buildings with an emphasis on building ecology
- has knowledge of building ecology assessment procedures and tools for design and assessment
- is capable of applying this knowledge to assessing the ecological advantageousness of buildings as well as their contribution to a sustainable development.

**Content**

Sustainable design, construction and operation of buildings currently are predominant topics of the real estate sector, as well as "green buildings". Not only designers and civil engineers, but also other actors who are concerned with project development, financing and insurance of buildings or portfolio management are interested in these topics.

On the one hand the courses included in this module cover the basics of energy-efficient, resource-saving and health-supporting design and construction of buildings. On the other hand fundamental assessment procedures for analysing and communicating the ecological advantageousness of technical solutions are discussed. With the basics of green building certification systems the lectures provide presently strongly demanded knowledge.

Additionally, videos and simulation tools are used for providing a better understanding of the content of teaching.

**Module: Real Estate Management [WI3BWLOOW2]**

**Coordination:** Thomas Lützkendorf  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Business Administration

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Winter Term	2

**Courses in module**

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

**Learning Control / Examinations**

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

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

The examination for the courses generally consist of a 60 minute written exam. A 20 minute oral exam is only offered after the second failure of the written exam. The exams for the respective parts (REM I and REM II) happen in the same semester in which the lectures take place. Therefore, REM I exams currently only take place in the winter semester and REM II exams take place in the summer semester. In each semester there are two alternative dates for the exam and exams can be re-sat at any regular exam date.

It is possible to include the grade of a seminar paper, dealing with a topic from the area of sustainable construction, into the final grade of the module (according to Section 4(2), 3 of the examination regulation). The seminar has a weight of 20 percent.

**Conditions**

Successful completion of the module *Business Administration* [WI1BWL].

**Recommendations**

The combination with the module *Design Constructions and Assessment of Green Buildings* [WI3BWLOOW1] is recommended. Furthermore a combination with courses in the area of

- Finance
- Insurance
- Civil engineering and architecture (building physics, building construction, facility management)

is recommended.

**Learning Outcomes**

The student

- possesses an overview concerning the different facets and interrelationships within the real estate business, the important decision points in real estate lifecycle and the different views and interests of the actors concerned, and
- is capable of applying basic economic methods and procedures to problems within the real estate area.

**Content**

The real estate business offers graduates very interesting jobs and excellent work- and advancement possibilities. This module provides an insight into the macroeconomic importance of this industry, discusses problems concerned to the administration of real estate and housing companies and provides basic knowledge for making decisions both along the lifecycle of a single building and the management of real estate portfolios. Innovative operating and financing models are illustrated, as well as the current development when looking at real estate as an asset-class.

This module is also suitable for students who want to discuss macroeconomic, business-management or financial problems in a real estate context.

**Module: Human Resource Management [WI3BWLIP1]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
n.n.	Human Resource Management and Labor Market Institutions	2/1	S	4,5	C. Harbring
25930	Strategic Human Resource Management	2/1	W	4,5	C. Harbring
25967	Industrial Studies of Time and Motion	2	W	3	S. Dürrschnabel
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 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**

Successful completion of the module *Business Administration* [WI1BWL].

**Learning Outcomes****Content**



## 6.2 Economics

### Module: Applied Game Theory [WI3VWL1]

**Coordination:** Siegfried Berninghaus  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Economics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

#### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25525	Game Theory I	2/2	S	4.5	S. Berninghaus
25369	Game Theory II	2/2	W	4.5	S. Berninghaus
25371	Industrial Organization	2/2	S	4.5	S. Berninghaus
25373	Experimental Economics	2/2	S	4,5	S. Berninghaus, Kroll
26240	Competition in Networks	2/1	W	4.5	K. Mitusch

#### Learning Control / Examinations

The assessment is carried out as partial exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Every singled lecture is examined within a 80 min. written exam at the end of the of the recess period. Re-examinations are 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.

In the lecture *Experimental Economics* [25373] there may be the possibility - depending on the lecturer - to improve the final mark of the passed exam by writing a term paper and presenting it in class.

#### Conditions

One of the lectures *Game Theory I* [25525] or *Game Theory II* [25369] has to be completed.

Successful completion of the module *Economics* [WW1VWL]. For exceptions see **remarks below**.

#### Recommendations

Good knowledge of mathematics and statistics is recommended.

#### Learning Outcomes

The student

- analyzes economic interdependencies under use of experimental mehtods and evaluates theoretial concepts,
- applies theoretical algorithms to economic and managerial problems,
- is able to analyze complex strategic decision problems by means of game theoretial concepts,
- knows basic solutions concepts of simple strategic decisions and is able to apply them to concrete economic problems,
- understands economic and managerial decision problems and is able to solve them by applying suitable solution concepts,
- knows experimental methods in economics from experiment design to evaluation of data.

#### Content

Lectures discuss individual as well as group decisions under (un-)certainty. Tutorials apply theoretical concepts to case studies. Theoretical models are compared to empirical findings.

#### Remarks

See german version.

The lecture *Competition in Networks* [26240] was included in this module in winter term 2010/11.

**Module: International Economics [WI3VWL3]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26254	International Economic Policy	2/0	S	4	J. Kowalski
26259	Management and Organisation of Projects in Developing Countries	2/1	W	5	N. Sieber
26252	International Economics	2/1	W	5	J. Kowalski

**Learning Control / Examinations**

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

**Note the changes in course offering under “remarks”.**

**Conditions**

Successful completion of the module *Economics* [WW1VWL].

**Learning Outcomes**

The students

- obtain comprehensive knowledge on open global economy
- become experts in dealing with the complex world-wide market, and are able to react to the challenges of the global economy

**Content**

Problems of the internationalisation of economic activities, European institutions and programs, as well as questions of the less developed countries and development policy.

**Module: Strategic Games [WI3VWL4]**

**Coordination:** Siegfried Berninghaus  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Economics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

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

**Learning Control / Examinations**

The assessment is carried out as partial written exams (according to Section 4(2), 1 of the examination regulation) of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. Every singled lecture is examined within a 80 min. written exam at the end of the of the recess period. Re-examinations are offered at every ordinary examination date. The assessment procedures are described for each course of the module seperately.

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

**Conditions**

None.

**Recommendations**

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

1. *Game Theory I* [25525]
2. *Game Theory II* [25369]

**Learning Outcomes**

The student

- structurizes complex strategic decision problems and applies efficient solution algorithms,
- has a broad overview over game and decision theory,
- applies tough methods to problems of political and managerial consulting,
- knows basic solution concepts of simple strategic decision situations and is able to apply them to concrete economic problems,
- knows and analyzes strategic decisions, knows advanced solution concepts and applies them,
- knows basic elements of decision theory under (un-)certainty as well as more advanced models and is able to analyze and solve these problems, understands decision behavior by cofronting it with experimental economics.

**Content**

The module consists of lectures in strategic decision making against other players or "nature". Building on normal and extensive form games different strategic and non-strategic decision situations are laid out. Then more complex situations (e.g., repeated bargaining, reputation building) are discussed.

**Module: Microeconomic Theory [WI3VWL6]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer 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
25525	Game Theory I	2/2	S	4.5	S. Berninghaus
26240	Competition in Networks	2/1	W	4.5	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 assessment procedures are described for each course of the module separately.

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

To improve the overall grade of the module, there might be taken optional term paper in the field of economics (ie, on the chairs Puppel, or at Berninghaus resp. at the IWW) within the module (according to Section 4(2), 3 of the examination regulation). The 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**

Successful completion of the module *Economics* [WW1VWL].

**Learning Outcomes****Content****Remarks**

The lecture *Competition in Networks* [26240] was included in this module.

**Module: Macroeconomic Theory [WI3VWL8]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 separately.

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

To improve the overall grade of the module, there might be taken optional term paper in the field of economics (ie, on the chairs Puppel, or at Berninghaus resp. at the IWW) within the module (according to Section 4(2), 3 of the examination regulation). The 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://vw11.ets.kit.edu/>).

**Conditions**

Successful completion of the module *Economics* [WW1VWL].

**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: Public Finance [WI3VWL9]**

**Coordination:** Berthold Wigger  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Economics

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
26120	Public Revenues	2/1	S	4,5	B. Wigger, Assistenten
26129	Specific Aspects in Taxation	3	W	4,5	B. Wigger, A. Presse

**Learning Control / Examinations**

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

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

**Conditions**

Successful completion of the module *Economics* [WW1VWL].

**Learning Outcomes****Content**

As a branch of Economics, Public Finance is concerned with the theory and policy of the public sector and its interrelations with the private sector. It analyzes the economic role of the state from a normative as well as from a positive point of view. The normative view examines efficiency- and equity-oriented motives for government intervention and develops fiscal policy guidelines. The positive view explains the actual behavior of economic agents in public sector affairs. Special fields of Public Finance are public revenues, i.e. taxes and public debt, public expenditures for publicly provided goods, and welfare programs.

**Remarks**

The course *Finanzpolitik* [26122] has been replaced with the course *Spezielle Steuerlehre* [26129] since winter term 2010/11. The examination will be offered latest until summer term 2011 (repeaters only).

## 6.3 Statistics

### Module: Statistical Applications of Financial Risk Management [WI3STAT]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

#### Courses in module

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

#### Learning Control / Examinations

The assessment is carried out as partial exams of the single courses of this module, whose sum of credits must meet the minimum requirement of credits of this module. The assessment procedures are described for each course of the module separately.

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

#### Conditions

Successful completion of the module Statistics [WI1STAT].

#### Learning Outcomes

#### Content

## 6.4 Informatics

### Module: Emphasis Informatics [WI3INFO1]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

#### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
25780	Advanced Programming - Java Network Programming	2/1/2	S	5	D. Seese, Ratz
25886	Advanced Programming - Application of Business Software	2/1/2	W	5	A. Oberweis, S. Klink
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
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25740	Knowledge Management	2/1	W	5	R. Studer
25760	Complexity Management	2/1	S	5	D. Seese
25728	Software Engineering	2/1	W	5	A. Oberweis, D. Seese
25700	Efficient Algorithms	2/1	S	5	H. Schmeck
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
Platzhalter	Special Topics of Applied Informatics	2/1	W/S	5	A. Oberweis, H. Schmeck, D. Seese, R. Studer, S. Tai

#### 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. For passing the module exam in every singled partial exam the respective minimum requirements has to be achieved.

- Partial exam I: *Advanced Programming - Java Network Programming* [25889] or alternatively *Advanced Programming - Application of Business Software* [25886]
- Partial exam II: all the rest

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

Either the course *Advanced Programming - Java Network Programming* [25889] or the course *Advanced Programming - Application of Business Software* [25886] has to be attended.

#### Learning Outcomes

The student

- has the capability of dealing with the practical application of the Java programming language (which is the dominating programming language in many application areas) or alternatively the ability to configure, parametrize and deploy enterprise software to enable, support and automate business processes,
- is familiar with methods and systems of a core topic or core application area of computer science,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

#### Content



**Module: Electives in Informatic [WI3INFO2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
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
25702	Algorithms for Internet Applications	2/1	W	5	H. Schmeck
25700	Efficient Algorithms	2/1	S	5	H. Schmeck
25720	Database Systems	2/1	S	5	A. Oberweis, Dr. D. Sommer
25760	Complexity Management	2/1	S	5	D. Seese
25762	Intelligent Systems in Finance	2/1	S	5	D. Seese
25728	Software Engineering	2/1	W	5	A. Oberweis, D. Seese
25740	Knowledge Management	2/1	W	5	R. Studer
25748	Semantic Web Technologies I	2/1	W	5	R. Studer, S. Rudolph, A. Harth
25770	Service Oriented Computing 1	2/1	W	5	S. Tai
Platzhalter	Special Topics of Applied Informatics	2/1	W/S	5	A. Oberweis, H. Schmeck, D. Seese, R. Studer, S. Tai

**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**

None.

**Learning Outcomes**

The student

- knows and has mastered methods and systems for core topics and core application areas of computer science,
- can choose these methods and system situation adequately and can furthermore design and employ them for problem solving,
- is able to independently find strategic and creative answers in the finding of solutions to well defined, concrete, and abstract problems.

**Content**

## 6.5 Operations Research

### Module: Applications of Operations Research [WI3OR5]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
25490	Software Laboratory: OR Models I	1/2	W	4.5	S. Nickel
25134	Global Optimization I	2/1	W	4.5	O. Stein
25662	Simulation I	2/1/2	W	4.5	K. Waldmann

#### Learning Control / Examinations

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

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

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

#### Conditions

At least one of the courses *Facility Location and strategic Supply Chain Management* [25486] and *Tactical and operational Supply Chain Management* [25488] has to be taken.

#### Learning Outcomes

The student

- is familiar with basic concepts and terms of Supply Chain Management,
- knows the different areas of Supply Chain Management and their respective optimization problems,
- is acquainted with classical location problem models (in the plane, on networks and discrete) as well as fundamental methods for distribution and transport planning, inventory planning and management,
- is able to model practical problems mathematically and estimate their complexity as well as choose and adapt appropriate solution methods.

#### Content

Supply Chain Management is concerned with the planning and optimization of the entire, inter-company procurement, production and distribution process for several products taking place between different business partners (suppliers, logistics service providers, dealers). The main goal is to minimize the overall costs while taking into account several constraints including the satisfaction of customer demands.

This module considers several areas of Supply Chain Management. On the one hand, the determination of optimal locations within a supply chain is addressed. Strategic decisions concerning the location of facilities like production plants, distribution centers or warehouses are of high importance for the rentability of supply chains. Thoroughly carried out, location planning tasks allow an efficient flow of materials and lead to lower costs and increased customer service. On the other hand, the planning of material transport in the context of Supply Chain Management represents another focus of this module. By linking transport connections and different facilities, the material source (production plant) is connected with the material sink (customer). For given material flows or shipments, it is considered how to choose the optimal (in terms of minimal costs) distribution and transportation chain from the set of possible logistics chains, which asserts the compliance of delivery times and further constraints.

Furthermore, this module offers the possibility to learn about different aspects of the tactical and operational planning level in Supply Chain Management, including methods of scheduling as well as different approaches in procurement and distribution logistics. Finally, issues of warehousing and inventory management will be discussed.

#### Remarks

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

**Module: Methodical Foundations of OR [WI3OR6]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
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
25486	Facility Location and Strategic Supply Chain Management	2/1	S	4.5	S. Nickel
25679	Markov Decision Models I	2/1/2	W	5	K. Waldmann

**Learning Control / Examinations**

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

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

**Conditions**

At least one of the lectures *Nonlinear Optimization I* [25111] and *Global Optimization I* [25134] has to be examined.

**Learning Outcomes**

The student

- names and describes basic notions for optimization methods, in particular from nonlinear and from global optimization,
- knows the indispensable methods and models for quantitative analysis,
- models and classifies optimization problems and chooses the appropriate solution methods to solve also challenging optimization problems independently and, if necessary, with the aid of a computer,
- validates, illustrates and interprets the obtained solutions.

**Content**

The modul focuses on theoretical foundations as well as solution algorithms for optimization problems with continuous decision variables. The lectures on nonlinear programming deal with local solution concepts, whereas the lectures on global optimization treat approaches for global solutions.

**Remarks**

The planned lectures and courses for the next three years are announced online (<http://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 Methods and Simulation [WI3OR7]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
25662	Simulation I	2/1/2	W	4.5	K. Waldmann
25665	Simulation II	2/1/2	S	4.5	K. Waldmann
25111	Nonlinear Optimization I	2/1	S	4.5	O. Stein
25488	Tactical and Operational Supply Chain Management	2/1	W	4.5	S. Nickel

**Learning Control / Examinations**

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

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

**Conditions**

None.

**Learning Outcomes**

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

**Content**

Topics overview:

Stochastic Decision Models I: Markov Chains, Poisson Processes.

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

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

**Remarks**

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

## 6.6 Engineering Sciences

### Module: Introduction to Technical Logistics [WI3INGMB13]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
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
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

#### Learning Control / Examinations

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

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

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the IFL. The term paper may not be convalidated in the seminar module.

#### Conditions

Successful completion of the engineering modules of the core programm.

#### Learning Outcomes

The student acquires

- well-founded knowledge and method knowledge in the main topics of technical logistics,
- expertise and understanding about the functionality of conveyor technology,
- ability for modeling logistic systems with adequate accuracy by using simple models,
- ability to evaluate logistic systems and to identify cause-and-effects-chains within logistic systems.

#### Content

The module *Introduction to Technical Logistics* provides first insights into main topics of logistics. Within the lectures, the interaction between several components of material handling systems will be clarified. The focus will be on technical characteristics of material handling technology and basics for sizing of material handling systems. 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].

The course [21692] *Internationale Produktion und Logistik* is not offered here anymore.

Examinations for the canceled courses will be offered latest until summer term 2011.

**Module: Automotive Engineering [WI3INGMB5]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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-Automotive 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 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**

Successful completion of the engineering modules of the core programm.

**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 [WI3INGMB6]**

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

<b>ECTS Credits</b> 9	<b>Cycle</b> Every term	<b>Duration</b> 1
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**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-Automotive 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 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**

Successful completion of the engineering modules of the core programm.

**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 [WI3INGMB14]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2115817	Project Workshop-Automotive 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 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**

Successful completion of the engineering modules of the core programm.

**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 [WI3INGMB15]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 separately.

**Conditions**

Successful completion of the engineering modules of the core programm.

**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* [WI3INGMB15] 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 [WI3INGMB16]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 separately.

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

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

**Conditions**

Successful completion of the engineering modules of the core programme.  
 The course *Combustion Engines A* [21101] is obligatory.

**Recommendations**

Knowledge in the area of thermodynamics is helpful.

**Learning Outcomes****Content**

**Module: Engine Development [WI3INGMB17]**

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

<b>ECTS Credits</b> 18	<b>Cycle</b> Every term	<b>Duration</b> 2
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**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 separately.

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

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

**Conditions**

Successful completion of the engineering modules of the core programme.

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: Production Engineering I [WI3INGMB10]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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

**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**

Prerequisites for admission to examination:

- *Manufacturing Technology* [21657]: Successful Completion of the modules *Material Science* [W11ING2] and *Engineering Mechanics* [W11ING3]
- *Integrated Production Planning* [21660]: None.
- *Machine Tools 1 and 2* [2149900 and 2149901]: Successful completion of the module *Electrical Engineering* [W11ING4].

**Learning Outcomes**

The student

- knows and understands the content covered by the selected lectures and seminars of the module *Production Engineering I* (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use that knowledge in a targeted way for an efficient production engineering in the selected area.

**Content**

This module from the field of engineering science covers the basic aspects of production engineering, including one of the three subject areas manufacturing engineering, machine tool and handling technology and organisation and planning. For the module *Production Engineering I*, one subject area is required.

**Module: Production Engineering II [WI3INGMB4]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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

**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**

Prerequisites for admission to examination:

- *Manufacturing Technology* [21657]: Successful Completion of the modules *Material Science* [W11ING2] and *Engineering Mechanics* [W11ING3]
- *Integrated Production Planning* [21660]: None.
- *Machine Tools 1 and 2* [2149900 and 2149901]: Successful completion of the module *Electrical Engineering* [W11ING4].

**Learning Outcomes**

The student

- knows and understands the content covered by the selected lectures and seminars of the module *Production Engineering II* (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use that knowledge in a targeted way for an efficient production engineering in the selected areas.

**Content**

This module from the field of engineering science covers the basic aspects of production engineering, including two of the three subject areas manufacturing engineering, machine tool and handling technology and organisation and planning. For the *Production Engineering II* module two subject areas are required.

**Module: Production Engineering III [WI3INGMB7]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
27	Every term	2

**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

**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**

Admission requirements for the module examinations:

- *Manufacturing Engineering* [21657]: Successful completion of modules *Materials Science* [WI1ING2] and *Engineering Mechanics* [WI1ING3]
- *Integrated Production Planning* [21660]: None.
- *Machine Tools 1 and 2* [2149900 and 2149901]: Successful completion of the module *Electrical Engineering* [WI1ING4].

**Learning Outcomes**

The student

- knows and understands the content covered by the lectures and seminars of the module (manufacturing engineering, organisation and planning, machine tools and robots),
- is able to use that knowledge in a targeted way for an efficient production engineering.

**Content**

This module from the field of engineering science covers the basic aspects of production engineering, including manufacturing engineering, machine tools and handling technology and organisation and planning. For the module *Production Engineering III* all three subject areas are required.

**Module: Specialization in Engineering Science [WI3INGMB8]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer Term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21782	Material Science II for Business Engineers	2/1	S	4.5	M. Hoffmann
21226	Engineering Mechanics II	2/1	S	4.5	C. Proppe
23224	Electrical Engineering II	2/1	S	4.5	W. Menesklou

**Learning Control / Examinations**

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

The overall grade of the module is removed from the average of the partial examinations, with at least two partial exams need to be.

**Conditions**

The corresponding course of the fundamental studies to each course in this module has to be completed successfully.

**Learning Outcomes**

The learning objectives are given in the individual descriptions of the courses.

**Content**

**Module: Emphasis Material Science [WI3INGMB9]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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
21755	Introduction in Ceramics	2	W	4	M. Hoffmann
21775	Structural and Functional Ceramics	2	S	4	M. Hoffmann
21576	Systematic Selection of Materials	2/1	S	5	Wanner
21612	Physical Basics of Laser Technology	2/1	W	5	Schneider
21590	Polymerengineering I	2	W	4	P. Elsner
21596	Polymerengineering II	2	S	4	P. Elsner
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 Lightweight 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 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 *Material Science I* [21760] has to be completed successfully.

**Recommendations**

It is recommended to have natural science basic knowledge and to be familiar with the content of the course *Material Science II* [21782].

**Learning Outcomes**

The student understands and could explain

- microstructure property relationships for the most relevant material classes
- is able to select appropriate materials with respect to given technical applications

**Content**



**Module: Product Lifecycle Management [WI3INGMB21]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
21350	Product Lifecycle Management	3/1	W	6	J. Ovtcharova
21366	Product Lifecycle Management in the Manufacturing Industry	2/0	W	3	G. Meier
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 is carried out as a written exam about *Product Lifecycle Management* (90 min) (according to Section 4(2), 1 of the examination regulation) and a oral exam (ca. 30 min.) about another lecture (according to Section 4(2), 2 of the examination regulation), 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 made up of the grade for the written examination [67%] and the grade for the oral examination [33%].

**Conditions**

Successful completion of the engineering modules of the core programm.

**Learning Outcomes****Content**

**Module: Electrical Power Engineering [WI3INGETIT1]**

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

<b>ECTS Credits</b> 18	<b>Cycle</b> Every term	<b>Duration</b> 2
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**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
23391/23393	Systems for Electrical Energy	2/1	S	4,5	T. Leibfried
23371/23373	Power Network Analysis	2/2	W	6	T. Leibfried
23356	Energy Generation	2/0	W	3	B. Hoferer
23365	Diagnostics on Power Network Equipment	2/0	W	3	T. Leibfried
23390	Power Transformations	2	S	3	Schäfer
23382	Technique of Electrical Installation	2	S	3	Kühner
23396	Automation of Power Grids	2	S	3	Eichler

**Learning Control / Examinations**

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

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

**Conditions**

The engineering science modules of the fundamental studies have to be completed successfully.

**Learning Outcomes**

The student

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

**Content**

The module deals with basic knowledge about the structure and operation of electrical power networks and their needed facilities. Further lectures give an insight into specific topics, such as Automation in electric power engineering or the procedures for generating electrical energy.

**Remarks**

The course *Power Network Analysis* was formerly known as *Electric Power System Engineering I*.

The course *Diagnostics on Power Network Equipment [23365]* is not offered any more. Exams can still be taken until summer term 2011. Please contact the institute.

**Module: Control Engineering [W3INGETIT2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer 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
23168	Modelling and Identification	2/1	S	4.5	n.N.

**Learning Control / Examinations**

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

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

**Conditions**

The engineering science modules of the fundamental studies have to be completed successfully.

The courses are to be attended in the following sequence:

1. *System Dynamics and Control Engineering* [23155]
2. *Modelling and Identification* [23168]

**Recommendations**

Knowledge of integral transformations are assumed. There it is recommended to attend the courses *Complex Analysis* and *Integral Transformations* beforehand.

**Learning Outcomes**

The students

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

**Content**

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

Above that, the students learn the basic principles and methods for the theoretical and experimental modelling of dynamic systems.

**Remarks**

The cycle for the lecture *System Dynamics and Control Engineering* [23155] has been changed from winterterm into summerterm.

**Module: Fundamentals of Spatial and Infrastructural Development [WI3INGBGU1]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer Term	1

**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
19026	Design Basics in Highway Engineering	1/1	S	3	R. Roos
19028	Spatial Planning and Planning Law	1/1	S	3	D. Engelke, Heberling

**Learning Control / Examinations**

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

The exam is offered in each semester as well as the re-examination. In case of failing or to improve the examination grade an additional oral examination (according to §4(2), 2 of the examination regulation) is offered in the same examination period.

The overall grade of the module corresponds to the grade of the written examination or the average of the marks for the written and the oral assessment.

**Conditions**

Successful completion of the engineering modules of the core program.

**Learning Outcomes**

Learning the fundamental terminology and methodology of spatial and transportation planning, traffic engineering as well as highway engineering

**Content**

Basic tasks and contents of different planning levels, for example: Land use and conflicts, provision of services and infrastructure as well as their costs, planning on local, regional, national and European level.

Fundamentals of transportation planning (convention for analyses, surveys of travel behaviour), fundamentals of traffic engineering

Design Basics in Highway Engineering: Road network layout, driving dynamics, principles of highway design; earthworks, pavements and their dimensioning

**Module: Foundations of Guided Systems [WI3INGBGU2]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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. Hohnacker
19306	Railway Logistics, Management and Operating - Part I	2	W	3	E. Hohnacker

**Learning Control / Examinations**

The assessment is carried out as a general written module exam according to Section 4 Abs. 2, Nr. 1 of the examination regulation. The module exam has a duration of 90 min.

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

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

**Conditions**

The engineering science modules of the fundamental studies have to be completed successfully.

**Learning Outcomes****Content**

**Module: Reaction Engineering I [WI3INGCV2]**

**Coordination:** Bettina Kraushaar-Czarnetzki  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Engineering Science

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every 2nd term, Summer Term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
22114	Reaction Engineering I	3/2	S	9	Müller

**Learning Control / Examinations**

The assessment is carried out by a written exam (according to §4 Abs. 2, Nr. 1 of the examination regulation) about the lecture Reaction Engineering I [22114].

The assessment takes place in the recess period and can be resited at every ordinary examination date.

Permitted utilities: calculator, script, its own formulary and own notes.

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

**Conditions**

None.

**Learning Outcomes**

The Student

- has acquired fundamental knowledge in chemical reaction engineering and knows the important reactor types used for homogeneous chemical and enzymatic reaction systems,
- can analyse the performance of reactors,
- is able to choose the suitable reactor type and to identify the optimum processing conditions for the efficient, sustainable and safe production of desired products.

**Content**

The course addresses mass balances of model reactors, selectivity control in multiple reactions, catalysis and kinetics of enzymatic reactions, energy balances and temperature effects.

## Module: Understanding and Prediction of Disasters I [WI3INGINTER1]

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

<b>ECTS Credits</b> 9	<b>Cycle</b> Every term	<b>Duration</b> 1
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### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
3201	Generically Meteorology /Climatology II	3/1	S	5.5	Orphal
03203	Meteorological Measurements	2	S	3.5	Kottmeier
03013	Meteorological Natural Hazards	2	W	3.5	Kottmeier, Kunz
04013	Tectonic Stress in Petroleum Rock Me- chanics	1/1	W	3	Müller
GEOD-BFB-1	Remote Sensing	3/2/1	S	7	Hinz, Weidner
20241/42	Remote Sensing Systems	1/1	S	2	Hinz, Weidner
20243/44	Remote Sensing Methods	2/1	S	2	Hinz, Weidner
20245	Hauptvermessungsübung III	0/1	S	1	S. Hinz, Weidner
20712/13	Introduction to GIS for students of natu- ral, engineering and geo sciences	2/2	W	4	Rösch
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	F. Nestmann
19632	Natural Disaster Management	1	W/S	1.5	N.N.
10557	Introduction to Engineering Geology and Hydrogeology	2	S	3	T. Liesch, P. Blum

### 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/exams 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

Successful completion of the engineering science moduls of the core program.

In Remote Sensing, *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243] can be chosen as a minimal combination, but it is strongly recommended to choose the comprehensive combination *Remote Sensing* [GEOD-BFB-1], which includes *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] and *Hauptvermessungsübung III* [20245].

There are **no singular exams** for *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243].

Therefore it is only possible to choose **either** *Remote Sensing* [GEOD-BFB-1] **or** one of the courses *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] *or* *Hauptvermessungsübung III* [20245] (because they are already included).

### 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 [WI3INGINTER2]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
3201	Generically Meteorology /Climatology II	3/1	S	5.5	Orphal
03203	Meteorological Measurements	2	S	3.5	Kottmeier
03013	Meteorological Natural Hazards	2	W	3.5	Kottmeier, Kunz
04013	Tectonic Stress in Petroleum Rock Me- chanics	1/1	W	3	Müller
GEOD-BFB-1	Remote Sensing	3/2/1	S	7	Hinz, Weidner
20241/42	Remote Sensing Systems	1/1	S	2	Hinz, Weidner
20243/44	Remote Sensing Methods	2/1	S	2	Hinz, Weidner
20245	Hauptvermessungsübung III	0/1	S	1	S. Hinz, Weidner
20712/13	Introduction to GIS for students of natu- ral, engineering and geo sciences	2/2	W	4	Rösch
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	F. Nestmann
19632	Natural Disaster Management	1	W/S	1.5	N.N.
10557	Introduction to Engineering Geology and Hydrogeology	2	S	3	T. Liesch, P. Blum

### 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

Successful completion of the engineering science moduls of the core program.

In Remote Sensing, *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243] can be chosen as a minimal combination, but it is strongly recommended to choose the comprehensive combination *Remote Sensing* [GEOD-BFB-1], which includes *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] and *Hauptvermessungsübung III* [20245].

There are **no singular exams** for *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243].

Therefore it is only possible to choose **either** *Remote Sensing* [GEOD-BFB-1] **or** one of the courses *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] **or** *Hauptvermessungsübung III* [20245] (because they are already included).

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 [WI3INGINTER5]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
3201	Generically Meteorology /Climatology II	3/1	S	5.5	Orphal
03013	Meteorological Natural Hazards	2	W	3.5	Kottmeier, Kunz
03203	Meteorological Measurements	2	S	3.5	Kottmeier
04013	Tectonic Stress in Petroleum Rock Me- chanics	1/1	W	3	Müller
GEOD-BFB-1	Remote Sensing	3/2/1	S	7	Hinz, Weidner
20241/42	Remote Sensing Systems	1/1	S	2	Hinz, Weidner
20243/44	Remote Sensing Methods	2/1	S	2	Hinz, Weidner
20245	Hauptvermessungsübung III	0/1	S	1	S. Hinz, Weidner
20712/13	Introduction to GIS for students of natu- ral, engineering and geo sciences	2/2	W	4	Rösch
19055	Hydraulic Engineering and Water Ressource Management I	2/2	W	6	F. Nestmann
19632	Natural Disaster Management	1	W/S	1.5	N.N.
10557	Introduction to Engineering Geology and Hydrogeology	2	S	3	T. Liesch, P. Blum

### 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

In Remote Sensing, *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243] can be chosen as a minimal combination, but it is strongly recommended to choose the comprehensive combination *Remote Sensing* [GEOD-BFB-1], which includes *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] and *Hauptvermessungsübung III* [20245].

There are **no singular exams** for *Remote Sensing Systems* [20241] and *Remote Sensing Methods* [20243].

Therefore it is only possible to choose **either** *Remote Sensing* [GEOD-BFB-1] **or** one of the courses *Remote Sensing Systems* [20241], *Remote Sensing Methods* [20243] **or** *Hauptvermessungsübung III* [20245] (because they are already included).

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 [WI3INGINTER3]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19315	Safety Management in Highway Engineering	1	W	2	M. Zimmermann
21061	Safety Engineering	2	W	4	Kany
21037	Industrial Safety and Environmental Management	2	S	4	Zülch, Kiparski
21030	Occupational Health and Safety Management and Systems	1	W	2	Zülch

**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**

Successful completion of the engineering modules of the core program.

**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.

*From the winter term 2010/2011 on, the lecture **Safety Engineering** has 3 credit points.*

**Module: Safety Science II [WI3INGINTER4]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
19315	Safety Management in Highway Engineering	1	W	2	M. Zimmermann
21061	Safety Engineering	2	W	4	Kany
21037	Industrial Safety and Environmental Management	2	S	4	Zülch, Kiparski
21030	Occupational Health and Safety Management and Systems	1	W	2	Zülch
siwi_wahl	Additional Course Safety Sciences		W/S	2-9	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.

**In addition to the detailed displayed courses further suitable courses of the necessary credit amounts must be taken in agreement with the coordinator of the module to complete the module. On top of the minimum requirements, suitable courses can be chosen accordingly.**

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.

Successful completion of the engineering modules of the core program

**Learning Outcomes**

See German version.

**Content**

See German version.

**Remarks**

From the winter term 2010/2011 on, the lecture *Safety Engineering* has 3 credit points.

The module is offered as an extension module to *Safety Science I* from winter term 2010/11 on, therefore credit points were reduced to 9. Together with *Safety Science I* it is still possible to gain 18 credit points in total in the field of safety sciences.

**Module: Combustion Engines I [WI3INGMB18]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 [WI3INGMB19]**

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

<b>ECTS Credits</b> 9	<b>Cycle</b> Every term	<b>Duration</b> 1
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**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 separately.

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* [WI3INGMB18]. 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 [WI3INGMB23]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 separately.

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

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the 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 [WI3INGMB24]**

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
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 separately.

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

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the 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 [WI3INGMB22]**

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

<b>ECTS Credits</b> 9	<b>Cycle</b> Every term	<b>Duration</b>
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**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	Haepf
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 separately.

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

To improve the overall grade of the module up to one grading scale (0.3) there might be taken an optional term paper in the field of the 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* [WI3INGMB23] **or/and** *Integrated Production Planning* [WI3INGMB24]. 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: Rail System Technology [WI3INGMB25]**

**Coordination:** Peter Gratzfeld  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Engineering Science

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
2115919	Rail System Technology	2	W/S	3	P. Gratzfeld
2115995	Project Management in Rail Industry	2	W/S	3	P. Gratzfeld
2115996	Rail Vehicle Technology	2	W/S	3	P. Gratzfeld

**Learning Control / Examinations**

The assessment is carried out as a general oral exam (20 min.) (according to Section 4(2), 2 of the examination regulation) of the single courses 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.

**Conditions**

Successful completion of the engineering modules of the core programm.

**Recommendations**

The lectures can be taken simultaneously.

**Learning Outcomes**

- The students understand relations and interdependencies between rail vehicles, infrastructure and operation in a rail system.
- They deduct the fundamental requirements for rail vehicles out of it and assess concepts of rail vehicles.
- They know about major systems in a rail vehicle and evaluate their fitness in specific fields of application.
- The students realize that the typical business model in railway industry is a project. They learn main features and characteristics of project management in this area.

**Content**

- Overview about fundamental components of a modern rail system (vehicles, infrastructure, operation)
- history and economic impact of rail systems
- Vehicle dynamics, wheel-rail-contact, train protection, traction power supply
- Main systems of rail vehicles (electric and non-electric traction drive, bogies, brakes)
- Vehicle concepts for mass transit and main line
- Main features and characteristics of project management in railway industry (project management system, organization, main processes)

**Module: Unscheduled Engineering Module [WI3INGAPL]**

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

ECTS Credits	Cycle	Duration
9		

**Learning Control / Examinations**

The assessment of the module is determined by the respective module coordinator. It can either be in the form of a general exam or partial exams, and must contain at least 9 credit points 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**

## 6.7 Law

### Module: Elective Module Law [WI3JURA]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	2

#### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
24012	Civil Law for Beginners	4/0	W	4	T. Dreier, P. Sester
24016	Public Law I - Basic Principles	2/0	W	3	I. Spiecker genannt Döhmann
24520	Public Law II - Public Economic Law	2/0	S	3	I. Spiecker genannt Döhmann

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

- *Civil Law for Beginners*: written exam (90 min)
- *Public Law I/II*: overall written exam (120 min)

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

## 6.8 Sociology

### Module: Sociology/Empirical Social Research [WI3SOZ]

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

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

#### Courses in module

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
11005	Social structures of modern societies	2	W	4	G. Nollmann
spezSoz	Special Sociology	2	W/S	2	G. Nollmann, Pfadenhauer, Pfaff, Haupt, Grenz, Eisewicht, Kunz
SozSem	Projectseminar	2	W/S	4	Bernart, Kunz, Pfaff, Haupt, Grenz, Eisewicht

#### Learning Control / Examinations

The assessment is carried out as a general written exam (according to Section 4(2), 1 of the examination regulation). The specific theme of the written exam is arranged with the module coordinator personally. The single courses of the module are completed with an assessment as well. The assessment procedures are described for each course of the module separately. The overall grade of the module corresponds to the grade of the written exam.

#### Conditions

None.

#### Recommendations

Knowledge of Statistics 1 and Statistics 2 is required.

#### Learning Outcomes

The student

- Gains theoretical and methodical knowledge of social processes and structures
- Is able to apply acquired knowledge practically
- Is able to present work results in a precise and clear way

#### Content

This module offers students the possibility to get to know research problems 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, this module contains courses on sociological methods that are essential to answer the above questions scientifically.

**Module: Qualitative Social Research [WI3SOZ2]**

**Coordination:** Gerd Nollmann, Pfadenhauer  
**Degree programme:** Wirtschaftsingenieurwesen (B.Sc.)  
**Subject:** Sociology

<b>ECTS Credits</b>	<b>Cycle</b>	<b>Duration</b>
9	Every term	1

**Courses in module**

ID	Course	Hours per week C/E/T	Term	CP	Responsible Lecturer(s)
n.n.	Interpretative Social Research Methods	2/0	W	4	Pfadenhauer
spezSoz	Special Sociology	2	W/S	2	G. Nollmann, Pfadenhauer, Pfaff, Haupt, Grenz, Eisewicht, Kunz
n.n.	Explorative-interpretative Project Seminar	2/0	W/S	2/4	Pfadenhauer, Kunz, Grenz, Eisewicht

**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 lecture *Interpretative Social Research Methods* [n.n.] has to be completed successfully.

**Learning Outcomes**

The student

- possesses a basic overview of the well-established and some of the advanced explorative methods of data collection and interpretative methods of data evaluation,
- can address basic sociological questions to subjects of different types,
- and is capable of choosing and applying appropriate explorative-interpretative methods according to a research question.

**Content**

Qualitative Social Research is of major importance not only in (Social) Sciences but also in applied economic contexts. Within the framework of this module the student gets taught basic and advanced methods of non-standardised data collection, fixation and evaluation. Accordingly the module consists of three courses:

- the lecture 'Interpretative Social Research Methods' which ends with a written exam (4 LP).
- a course 'Special Sociology' of choice in which 2 or 4 credits have to be obtained (6 credits needed in course and project course combined).
- a project course focusing on explorative-interpretative methods in which 2 or 4 credits have to be obtained (6 credits needed in course and project course combined).

## 6.9 General Modules

### Module: Seminar Module [WI3SEM]

**Coordination:** Marliese Uhrig-Homburg, Studiendekan (Fak. f. Wirtschaftswissenschaften)  
**Degree programme:** Wirtschaftsingenieurwesen (B.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
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
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
25191	Bachelor Seminar in Foundations of Marketing	2/0	W/S	3	W. Gaul
26524	Bachelor Seminar in Information Engineering and Management	2	W/S	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
SemIWW3		2	W/S	3	I. Ott
26130	Seminar Public Finance	2	W/S	3	B. Wigger, Assistenten
26263	Seminar on Network Economics	2	W/S	3	K. Mitusch
25131	Seminar in Continuous Optimization	2	W/S	3	O. Stein
SemWIOR1	Seminar Stochastic Models	2	W/S	3	K. Waldmann
25491	Seminar in Discrete Optimization	2	W/S	3	S. Nickel
26470	Seminar Service Science, Management & Engineering	2	W/S	3	S. Tai, C. Weinhardt, G. Satzger, R. Studer
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
HoC3	Elective Foreign Languages	2-4	W/S	2-4	House of Competence
HoC4	Elective "Tutor Programmes"	k.A.	W/S	2 / 3	House of Competence
HoC2	Elective "Workshops for Competence and Creativity"	meist 2	W/S	3	House of Competence
HoC5	Elective "Personal Fitness & Emotional Competence"	k.A.	W/S	2-3	House of Competence
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**

All modules of the core programme should have been absolved. Furthermore 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 detailed 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 detailed 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: Internship [WI3EXPRAK]

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

ECTS Credits	Cycle	Duration
8		

### Learning Control / Examinations

The assessment is carried out by the evidence of completed full-time internships of at least eight weeks a and a presentation of the internship in the form of a written report on the activities.

#### 1. Information on evidence of completed full-time internships:

The internship is proofed by the certificate of the intern's office. The certificate has to be formally correct with official corporate letterhead and handwritten countersigned by a responsible employee of the company.

The certificate must at least contain the following information:

- \* Company / Location
- \* Duration: from ... to ...
- \* Hours of work (weekly)
- \* Working interruption, indicating the vacation and sick days
- \* Department
- \* Headwords to the activities

#### 2. Information on to the presentation:

The internship report should be at least one page (typewritten, not handwritten) for each Location. It must be countersigned by a representative of the intern's office.

### Conditions

Internships, that were completed even before studying may be recognized, if the criteria for recognition are met. After recognition of the compulsory internship, there can be taken a semester off for a voluntary, student-related internship. The possibility is particularly interesting in view of the master programme, which requires internships of at least 20 weeks.

If the compulsory internship is absolved within the Bachelor Programme and if it takes at least 14 weeks, students may request tuition exemption, when at least 8 weeks of the internship takes place in the lecture time.

Regarding to the election of the company, in which the internship is completed, there are no specific rules. With a view to the future professional career, it is recommended to absolve the internship in a larger, possibly international company.

### Learning Outcomes

Students

- engage in practical aspects of Business Engineering and get to know the professional requirements,
- gain a general insight into the operations of a company,
- identify companies complexity and developing knowledge and skills, which facilitate the understanding of operational sequences,
- train key qualifications such as personal initiative (already in the application), team skills and the ability to integrate into occupational hierarchie.

### Content

The internship may be done in economic, business and/or technical companies. At best, it is done on activities which are located at the intersection of the two fields - getting to know the specific requirements of business engineering.

A commercial internship provides an insight into business or administrative processes of business transactions. Therefore departments such as controlling, organizing, marketing and planning appear particularly suitable.

Work experiences in the departments of engineering, work preparation and provision of material or IT cover more technical aspects of the internship. But work experiences in an engineering firm go with a technical internship.

It remains the companies and interns left, which stations and areas the intern will eventually go through. But the focus should always be in accordance with operational realities of the company.

**Remarks**

Vacation days are not figured into the internship.

Only three sick leave days may incurred at all. Any additional sick days are not figured into the internship.

A relevant vocational education of at least two years is accepted as a performance equivalent to the internship.

It is recommended to do the internship before start of study.

## Module: Bachelor Thesis [WI3THESIS]

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

ECTS Credits	Cycle	Duration
12		

### Learning Control / Examinations

The Bachelor Thesis is a written exam which shows that the student can autonomously investigate a scientific problem in Business Engineering. The Bachelor 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 three months. On a reasoned request of the student, the examination board can extend the processing time of a maximum of one month. If the Bachelor Thesis is not completed in time, this exam is "failed", unless the student is not being responsible (eg maternity leave).

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

The overall grade of the module is the grade of the Bachelor Thesis.

### Conditions

Prerequisite for admission to the Bachelor thesis is that the student is usually in the 3rd Academic year (5th and 6th semester) and has at most one of the exams of the core program (according to § 17 paragraph 2 examination regulation) not been completed.

It is recommended to begin the Bachelor Thesis in the 5th or 6th Semester.

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

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

The Bachelor 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 Bachelor Thesis will not be accepted.

### Learning Outcomes

#### Content

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

## **Neubekanntmachung der Studien- und Prüfungsordnung der Universität Karlsruhe (TH) für den Bachelorstudiengang Wirtschaftsingenieurwesen**

**in der Fassung vom 15. August 2008**

Aufgrund von § 34 Absatz 1 Satz 1 des Landeshochschulgesetzes (LHG) vom 1. Januar 2005 hat der Senat der Universität Karlsruhe (TH) am 26. Februar 2007 die folgende Studien- und Prüfungsordnung für den Bachelorstudiengang Wirtschaftsingenieurwesen beschlossen.

Der Rektor hat seine Zustimmung am 06. März 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 Bachelorprüfungsordnung regelt Studienablauf, Prüfungen und den Abschluss des Studiums im Bachelorstudiengang Wirtschaftsingenieurwesen an der Universität Karlsruhe (TH).
- (2) Im Bachelorstudium sollen die wissenschaftlichen Grundlagen und die Methodenkompetenz der Fachwissenschaften vermittelt werden. Ziel des Studiums ist die Fähigkeit, das erworbene Wissen berufsfeldbezogen anzuwenden sowie einen konsekutiven Masterstudiengang erfolgreich absolvieren zu können.

### § 2 Akademischer Grad

Aufgrund der bestandenen Bachelorprüfung wird der akademische Grad „Bachelor of Science“ (abgekürzt: „B.Sc.“) für den Bachelorstudiengang Wirtschaftsingenieurwesen verliehen.

### § 3 Regelstudienzeit, Studienaufbau, Leistungspunkte

- (1) Die Regelstudienzeit beträgt sechs Semester. Sie umfasst ein Betriebspraktikum, Prüfungen und die Bachelorarbeit.
- (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 § 17 definiert.
- (3) Der für das Absolvieren von Lehrveranstaltungen und Modulen vorgesehene Arbeitsaufwand wird in Leistungspunkten (Credits) ausgewiesen. Die Maßstäbe für die Zuordnung von Leistungspunkten entsprechen dem ECTS (European Credit Transfer System). Ein Leistungspunkt entspricht einem Arbeitsaufwand von etwa 30 Stunden.
- (4) Der Umfang der für den erfolgreichen Abschluss des Studiums erforderlichen Studienleistungen wird in Leistungspunkten gemessen und beträgt insgesamt 180 Leistungspunkte.
- (5) Die 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 Bachelorprüfung besteht aus einer Bachelorarbeit, Fachprüfungen und einem Seminar-Modul. 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 Seminar-Module.
- (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.

**(3)** In den Fachprüfungen (nach § 17 Absatz 2 und Absatz 3 Nr. 1 bis 7) 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 Bachelorarbeit 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

1. 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 oder
2. die in § 18 genannte Voraussetzung nicht erfüllt ist.

In Zweifelsfällen entscheidet der Prüfungsausschuss.

### **§ 6 Durchführung von Prüfungen und Erfolgskontrollen**

**(1)** Erfolgskontrollen werden studienbegleitend, in der Regel im Verlauf der Vermittlung der Lehrinhalte der einzelnen Module oder zeitnah danach, durchgeführt.

**(2)** Die Art der 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 § 15 Absatz 2 oder § 15 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 nächstbessere 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 abzunehmen und zu bewerten. Vor der Festsetzung der Note hört der Prüfer die anderen an der Kollegialprüfung mitwirkenden Prüfer an. Mündliche Prüfungen dauern in der Regel mindestens 15 Minuten und maximal 45 Minuten pro 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 Bachelorzeugnis dürfen nur folgende Noten verwendet werden:

1	=	sehr gut (very good)	=	hervorragende Leistung
2	=	gut (good)	=	eine Leistung, die erheblich über den durchschnittlichen Anforderungen liegt
3	=	befriedigend (satisfactory)	=	eine Leistung, die durchschnittlichen Anforderungen entspricht
4	=	ausreichend (sufficient)	=	eine Leistung, die trotz ihrer Mängel noch den Anforderungen genügt
5	=	nicht ausreichend (failed)	=	eine Leistung, die wegen erheblicher Mängel nicht den Anforderungen genügt

Für die Bachelorarbeit 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.

**(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 Bachelorarbeit, 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 § 13 nachträglich geltend gemacht werden.

**(12)** Die Gesamtnote der Bachelorprüfung, 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 Bachelorprüfung nach folgender Skala vergeben:

ECTS-Note	Quote	Definition
A	10	gehört zu den besten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben
B	25	gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben
C	30	gehört zu den nächsten 30 % der Studierenden, die die Erfolgskontrolle bestanden haben
D	25	gehört zu den nächsten 25 % der Studierenden, die die Erfolgskontrolle bestanden haben
E	10	gehört zu den letzten 10 % der Studierenden, die die Erfolgskontrolle bestanden haben
FX		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, Orientierungsprüfung, Wiederholung von Prüfungen und Erfolgskontrollen**

**(1)** Die Modulteilprüfung Mikroökonomie (VWL I) im Fach Volkswirtschaftslehre (gemäß § 17 Absatz 2 Nr. 2) und die Modulteilprüfung Statistik I im Fach Statistik (gemäß § 17 Absatz 2 Nr. 7) sind bis zum Ende des Prüfungszeitraums des zweiten Fachsemesters abzulegen (Orientierungsprüfungen).

Wer die Orientierungsprüfungen einschließlich etwaiger Wiederholungen bis zum Ende des Prüfungszeitraums des dritten Fachsemesters nicht abgelegt hat, verliert den Prüfungsanspruch im Studiengang, es sei denn, dass er die Fristüberschreitung nicht zu vertreten hat, hierüber entscheidet der Prüfungsausschuss auf Antrag des Studierenden. Eine zweite Wiederholung der Orientierungsprüfungen ist ausgeschlossen.

**(2)** 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.

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

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

**(5)** Die Wiederholung einer Erfolgskontrolle anderer Art (§ 4 Absatz 2 Nr. 3) wird im Modulhandbuch geregelt.

(6) Eine zweite Wiederholung derselben schriftlichen oder mündlichen Prüfung ist nur in Ausnahmefällen zulässig. Einen Antrag auf Zweitwiederholung hat der Studierende schriftlich beim Prüfungsausschuss zu stellen. Über den ersten Antrag auf Zweitwiederholung entscheidet der Prüfungsausschuss, wenn er den Antrag genehmigt. Wenn der Prüfungsausschuss diesen Antrag ablehnt, entscheidet der Rektor. Über weitere Anträge auf Zweitwiederholung entscheidet nach Stellungnahme des Prüfungsausschusses der Rektor. Absatz 2 Satz 2 und Satz 3 gilt entsprechend.

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

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

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

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

(10) Ist gemäß § 34 Absatz 2 Satz 3 LHG die Bachelorprüfung bis zum Beginn der Vorlesungszeit des zehnten 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.

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

1. Der Prüfungsausschuss lehnt einen Antrag auf Fristverlängerung nach Absatz 1 oder Absatz 10 ab.
2. Die Bachelorarbeit 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 6 genehmigt wird. Dies gilt auch sinngemäß für die Bachelorarbeit.

### **§ 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 Bachelorarbeit nicht innerhalb der vorgesehenen Bearbeitungszeit erbracht wird, es sei denn, der Studierende hat die Fristüberschreitung nicht zu vertreten.

(3) Der für den Rücktritt nach Beginn der Prüfung oder das Versäumnis geltend gemachte Grund muss dem Prüfungsausschuss unverzüglich schriftlich angezeigt und glaubhaft gemacht werden. Bei Krankheit des Studierenden oder eines von ihm allein zu versorgenden Kindes oder pflegebedürftigen Angehörigen kann 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) zur 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 Bachelorarbeit kann nicht durch Elternzeit unterbrochen werden. Die gestellte Arbeit gilt als nicht vergeben. Nach Ablauf der Elternzeit erhält der Studierende ein neues Thema.

### **§ 11 Bachelorarbeit**

(1) Voraussetzung für die Zulassung zur Bachelorarbeit ist, dass der Studierende sich in der Regel im 3. Studienjahr befindet und nicht mehr als eine der Fachprüfungen der ersten drei Fachsemester laut § 17 Absatz 2 noch nachzuweisen ist.

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 Bachelorarbeit erhält. Die Ausgabe des Themas erfolgt in diesem Fall über den Vorsitzenden des Prüfungsausschusses.

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

**(3)** Der Bachelorarbeit werden 12 Leistungspunkte zugeordnet. Die empfohlene Bearbeitungsdauer beträgt drei Monate. Die maximale Bearbeitungsdauer beträgt einschließlich einer Verlängerung vier Monate. Die Bachelorarbeit soll zeigen, dass der Studierende in der Lage ist, ein Problem aus seinem Fach selbstständig und in begrenzter Zeit nach wissenschaftlichen Methoden zu bearbeiten. Sie kann auch in englischer Sprache abgefasst werden.

**(4)** Die Bachelorarbeit kann von jedem Prüfer nach § 15 Absatz 2 vergeben und betreut werden. Soll die Bachelorarbeit 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 Bachelorarbeit kann auch in Form einer Gruppenarbeit zugelassen werden, wenn der als Prüfungsleistung zu bewertende Beitrag des einzelnen Studierenden aufgrund objektiver Kriterien, die eine eindeutige Abgrenzung ermöglichen, deutlich unterscheidbar ist und die Anforderung nach Absatz 3 erfüllt.

**(5)** Bei der Abgabe der Bachelorarbeit hat der Studierende schriftlich zu versichern, dass er die Arbeit selbstständig verfasst hat und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt hat, die wörtlich oder inhaltlich übernommenen Stellen als solche kenntlich gemacht und die Satzung der Universität Karlsruhe (TH) zur Sicherung guter wissenschaftlicher Praxis in der jeweils gültigen Fassung beachtet hat. Wenn diese Erklärung nicht enthalten ist, wird die Arbeit nicht angenommen. Bei Abgabe einer unwahren Versicherung wird die Bachelorarbeit mit „nicht ausreichend“ (5.0) bewertet.

**(6)** Der Zeitpunkt der Ausgabe des Themas der Bachelorarbeit und der Zeitpunkt der Abgabe der Bachelorarbeit sind beim Prüfungsausschuss aktenkundig zu machen. 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 einen Monat verlängern. Wird die Bachelorarbeit nicht fristgerecht abgeliefert, gilt sie als mit „nicht ausreichend“ bewertet, es sei denn, dass der Studierende dieses Versäumnis nicht zu vertreten hat. § 8 gilt entsprechend.

**(7)** Die Bachelorarbeit wird von einem Betreuer sowie in der Regel von einem weiteren Prüfer bewertet. Einer der beiden muss Juniorprofessor oder Professor sein. Bei nicht übereinstimmender Beurteilung der beiden Prüfer setzt der Prüfungsausschuss im Rahmen der Bewertung der beiden Prüfer die Note der Bachelorarbeit fest. Der Bewertungszeitraum soll sechs Wochen nicht überschreiten.

## **§ 12 Berufspraktikum**

**(1)** Während des Bachelorstudiums ist ein mindestens achtwöchiges Berufspraktikum, welches mit acht Leistungspunkten bewertet wird, abzuleisten.

**(2)** Der Studierende setzt sich dazu in eigener Verantwortung mit geeigneten Unternehmen in Verbindung. Der Praktikant wird von einem Prüfer nach § 15 Absatz 2 und einem Mitarbeiter des Unternehmens betreut.

**(3)** Am Ende des Berufspraktikums ist dem Prüfer ein kurzer Bericht abzugeben und eine Kurzpräsentation über die Erfahrungen im Berufspraktikum zu halten.

**(4)** Das Berufspraktikum ist abgeschlossen, wenn eine mindestens achtwöchige Tätigkeit nachgewiesen wird, der Bericht abgegeben und die Kurzpräsentation gehalten wurde. Die Durchführung des Berufspraktikums ist im Studienplan oder Modulhandbuch zu regeln. Das Berufspraktikum geht nicht in die Gesamtnote ein.

### § 13 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 Bachelorzeugnis 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.

### § 14 Prüfungsausschuss

(1) Für den Bachelorstudiengang 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.

### **§ 15 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 Bachelorarbeit muss ein Prüfer Hochschullehrer sein.

(3) Soweit Lehrveranstaltungen von anderen als den unter Absatz 2 genannten Personen durchgeführt werden, sollen diese zum Prüfer bestellt werden, wenn die Fakultät ihnen eine diesbezügliche Prüfungsbefugnis erteilt hat.

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

### **§ 16 Anrechnung von Studienzeiten, Anerkennung von Studienleistungen und Modulprüfungen**

(1) Studienzeiten und gleichwertige Studienleistungen und Modulprüfungen, die in gleichen oder anderen Studiengängen an anderen Hochschulen erbracht wurden, werden auf Antrag angerechnet. Gleichwertigkeit ist festzustellen, wenn Leistungen in Inhalt, Umfang und in den Anforderungen denjenigen des Studiengangs im Wesentlichen entsprechen. Dabei ist kein schematischer Vergleich, sondern eine Gesamtbetrachtung vorzunehmen. Bezüglich des Umfangs einer zur Anerkennung vorgelegten Studienleistung und Modulprüfung werden die Grundsätze des ECTS herangezogen; die inhaltliche Gleichwertigkeitsprüfung orientiert sich an den Qualifikationszielen des Moduls.

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

(3) Bei der Anrechnung von Studienzeiten und der Anerkennung von Studienleistungen und Modulprüfungen, die außerhalb der Bundesrepublik erbracht wurden, sind die von der Kultusministerkonferenz und der Hochschulrektorenkonferenz gebilligten Äquivalenzvereinbarungen sowie Absprachen im Rahmen der Hochschulpartnerschaften zu beachten.

(4) Absatz 1 gilt auch für Studienzeiten, Studienleistungen und Modulprüfungen, die in staatlich anerkannten Fernstudien und an anderen Bildungseinrichtungen, insbesondere an staatlichen oder staatlich anerkannten Berufsakademien erworben wurden.

(5) Die Anerkennung von Teilen der Bachelorprüfung 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 Bachelorarbeit 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. Bachelorprüfung

### § 17 Umfang und Art der Bachelorprüfung

(1) Die Bachelorprüfung besteht aus den Fachprüfungen nach Absatz 2 und Absatz 3, dem Seminarmodul nach Absatz 4 sowie der Bachelorarbeit nach § 11.

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

1. Betriebswirtschaftslehre im Umfang von 15 Leistungspunkten,
2. Volkswirtschaftslehre im Umfang von 10 Leistungspunkten,
3. Informatik im Umfang von 15 Leistungspunkten,
4. Operations Research im Umfang von 9 Leistungspunkten,
5. Ingenieurwissenschaften im Umfang von 10 Leistungspunkten,
6. Mathematik im Umfang von 21 Leistungspunkten,
7. Statistik im Umfang von 10 Leistungspunkten.

Die Module, die ihnen zugeordneten Leistungspunkte und die Zuordnung der Module zu den Fächern sind im Studienplan oder Modulhandbuch festgelegt. Zur entsprechenden Modulprüfung kann nur zugelassen werden, wer die Anforderungen nach § 5 erfüllt.

(3) Im vierten bis sechsten Semester sind Fachprüfungen im Umfang von sieben Modulen mit je neun Leistungspunkten abzulegen. Die Module verteilen sich folgendermaßen auf die Fächer:

1. Betriebswirtschaftslehre,
2. Volkswirtschaftslehre,
3. Informatik,
4. Operations Research,
5. Ingenieurwissenschaften,
6. Betriebswirtschaftslehre oder Ingenieurwissenschaften,
7. Wahlpflichtfach: Informatik, Operations Research, Betriebswirtschaftslehre, Volkswirtschaftslehre, Ingenieurwissenschaften, Statistik, Recht oder Soziologie.

Die in den Fächern zur Auswahl stehenden Module sowie die diesen zugeordneten Lehrveranstaltungen werden im Studienplan oder Modulhandbuch bekannt gegeben. Der Studienplan oder das Modulhandbuch kann auch Mehrfachmodule definieren, die aus 18 Leistungspunkten (Doppelmodul) bzw. 27 Leistungspunkten (Dreifachmodul) bestehen und für Fachprüfungen nach 1. bis 7. 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.

(4) 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.

(5) Als weitere Prüfungsleistung ist eine Bachelorarbeit gemäß § 11 anzufertigen. Der Bachelorarbeit werden 12 Leistungspunkte zugeordnet.

(6) Prüfungen nach § 17 Absatz 3 können in einem Fach nur absolviert werden, wenn eine eventuelle Prüfung dieses Fachs nach § 17 Absatz 2 erfolgreich absolviert wurde. Auf Antrag eines Studierenden kann der Prüfungsausschuss hierzu Ausnahmen genehmigen.

**§ 18 Leistungsnachweise für die Bachelorprüfung**

Voraussetzung für die Anmeldung zur letzten Prüfung der Bachelorprüfung nach § 17 Absatz 1 ist die Bescheinigung über das erfolgreich abgeleistete Berufspraktikum nach § 12. In Ausnahmefällen, die der Studierende nicht zu vertreten hat, kann der Prüfungsausschuss die nachträgliche Vorlage dieses Leistungsnachweises genehmigen.

**§ 19 Bestehen der Bachelorprüfung, Bildung der Gesamtnote**

(1) Die Bachelorprüfung ist bestanden, wenn alle in § 17 genannten Prüfungsleistungen mindestens mit „ausreichend“ bewertet wurden.

(2) Die Gesamtnote der Bachelorprüfung errechnet sich als ein mit Leistungspunkten gewichteter Notendurchschnitt. Dabei werden die Noten gemäß § 17 Absatz 3 und 4 sowie der Bachelorarbeit jeweils mit dem doppelten Gewicht der Noten gemäß § 17 Absatz 2 berücksichtigt.

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

**§ 20 Bachelorzeugnis, Bachelorurkunde, Transcript of Records und Diploma Supplement**

(1) Über die Bachelorprüfung wird nach Bewertung der letzten Prüfungsleistung eine Bachelorurkunde und ein Zeugnis erstellt. Die Ausfertigung von Bachelorurkunde und Zeugnis soll nicht später als sechs Wochen nach der Bewertung der letzten Prüfungsleistung erfolgen. Bachelorurkunde und Bachelorzeugnis werden in deutscher und englischer Sprache ausgestellt. Bachelorurkunde und Zeugnis tragen das Datum der letzten nachgewiesenen Prüfungsleistung. Sie werden dem Studierenden gleichzeitig ausgehändigt. In der Bachelorurkunde wird die Verleihung des akademischen Bachelorgrades beurkundet. Die Bachelorurkunde wird vom Rektor und vom Dekan unterzeichnet und mit dem Siegel der Universität versehen.

(2) Das Zeugnis enthält die in den Fachprüfungen, den zugeordneten Modulprüfungen sowie dem Seminarmodul und der Bachelorarbeit 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).

(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 deutlich erkennbar sein. Angerechnete Studienleistungen sind im Transcript of Records aufzunehmen.

(5) Die Bachelorurkunde, das Bachelorzeugnis und das Diploma Supplement einschließlich des Transcript of Records werden vom Studienbüro der Universität ausgestellt.



### III. Schlussbestimmungen

#### § 21 Bescheid über Nicht-Bestehen, Bescheinigung von Prüfungsleistungen

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

(2) Hat der Studierende die Bachelorprüfung endgültig nicht bestanden, wird ihm auf Antrag und gegen Vorlage der Exmatrikulationsbescheinigung eine schriftliche Bescheinigung ausgestellt, die die erbrachten Prüfungsleistungen und deren Noten 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.

#### § 22 Aberkennung des Bachelorgrades

(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 Bachelorprüfung 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 Bachelorprüfung 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 Bachelorurkunde einzuziehen, wenn die Bachelorprüfung 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.

#### § 23 Einsicht in die Prüfungsakten

(1) Nach Abschluss der Bachelorprüfung wird dem Studierenden auf Antrag innerhalb eines Jahres Einsicht in seine Bachelorarbeit, die darauf bezogenen Gutachten und in die Prüfungsprotokolle gewährt.

(2) 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.

#### § 24 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)

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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. März 2007

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

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