Westfälische Wilhelms-Universität Münster

Module Descriptions

Module Descriptions of the Bachelor of Science in Information Systems of the University of Münster
for students studying according to the examination rules from 2022 (PO 2022)
valid from winter semester 2022/23

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Contents

Study Plan

Semester	Credits	IS	Computer Science	Quantitative Methods	Business/Economics
0			*Pre-study course: Programming*	*Pre-study course: Mathematics (WWU)*	
1	30	Introduction to IS (3)	Programming (9)	Mathematics for IS (9)	Introduction to Business Administration, Fundamentals of Finance (9)
2	30	Data Management (6) Scientific Work & Ethics in IS (3)	Data Structures and Algorithms (9)	Operations Research (6)	Foundations of Accounting (6)
3	30	Business Process Management (6) IT-Law (6)	Software Engineering (6)	Data & Probability (6)	Operations Management (6)
4	30	Digital Work & Project Management (6)	IT-Systems (6)	System Analysis & Probability (6) Data Analysis	
		Seminar 1 (6)			
5	30	Digital Business (6) IT-driven Innovation (6)			Introduction to Economics for IS (6)
		Seminar 2 (6)			
6	30	Elective (Approved Internship or Selected Topics in Business Adminisration odr Selected Chaptrs in Computer Science (6)			
			Security of Distributed Systems (6)		
		Projekt Seminar (12) Bachelor Thesis (12)			

Introduction to Information Systems

Module Title english:	Introduction to Information Systems				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 2 semesters	**Semester:** 1	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Introduction to Information Systems	Compulsory	30 h (2 CH)	60
2	Lecture	Scientific Work	Compulsory	15 h (1 CH)	30
3	Lecture	Ethics in Information Systems	Compulsory	15 h (1 CH)	30

4 **Module Contents:**

Background and relations to other courses:

The module serves as an introduction to information systems as an interdisciplinary scientific discipline and forms the basis for all other modules within the bachelor's program.

Main topics and learning objectives:

In the first part of the module, a lecture series is held in which the subject representatives of the Institute of Information Systems present their specific views on information systems as well as the respective methods used. They provide an outlook on how these subject areas relate to other future courses offered in the program. These are deepened by assignments accompanying the lectures. Reflections serve as an early examination of one's own interests and expectation management vis-à-vis the course of study. In the second part of the module, students are first taught the basics of scientific work in order to prepare them for future seminar papers and theses. The subsequent course enables students to understand social and ethical dimensions of information technologies and to place them in the context of information systems.

5 **Learning outcomes:**

Academic:

The competencies acquired in this module enable students to orient themselves in this environment through the overview of the diversity of information systems provided in the lectures. The students are already familiar with initial scientific and practical methods from the various areas of information systems. In addition, the students have methodological knowledge necessary for the preparation and writing of scientific texts. The students are able to reflect critically on the influence of information technologies on the various areas of life in society.

Soft skills:

The exercises accompanying the lectures lead to the ability of self-reflection and the application of self and time management methods. Through the obligatory presentation, the use of presentation techniques as well as the presentation in front of larger groups is practiced early in the study. Furthermore, social and communication skills are developed through collaborations.

6 **Description of possible electives within the modules:**
none

7 **Examination:** Examinations for every part of the module

8 **Relevant Work:** none

9 **Study Work:**

No	Number and Type; Connection to Course	Duration
1	Exercise accompanying lecture 1	approx. 12 pages
2	2 Reflections accompanying lecture 1	approx. 1000 words
3	Final presentation (lecture 1)	approx. 10 slides
4	Exercise accompanying lectures 2,3	approx. 25 pages

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	0.50 CP
	No 3	0.50 CP
Study Work	No 1	1.00 CP
	No 2	1.00 CP
	No 3	1.00 CP
	No 4	1.00 CP
Total		6 CP

12 **Weight of the module grade for the overall grade:**
0 %

13 **Module Prerequisites:**
none

14 **Presence:**
Attendance during the excursion is required, since the intended learning objectives (company visit, getting to know the work area of an information systems specialist) can only be achieved through participation.

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	none
	No 1: Introduction to Information Systems

	English translation of module components from section 3	No 2: Scientific Work No 3: Ethics in Information Systems
16	**Responsible Lecturer:** Dr. Katrin Bergener, Dr. Armin Stein	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

Programming

Module Title english:	Programming				
Course Program:	Bachelor Information Systems				
1	**Module No:** Inf1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 1	**CP:** 9	**Workload (h):** 270

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Programming	Compulsory	60 h (4 CH)	60
2	Exercise	Exercises on Programming	Compulsory	30 h (2 CH)	120

4 **Module Contents:**

Background and relations to other courses:

There are no prerequisites for this course. The conveyed programming skills are required in several other courses such as e.g. software engineering. Moreover, they are needed in the project seminar and (in many cases) for the bachelor thesis.

Main topics and learning objectives:

This course introduces the main concepts of programming languages and programming techniques. The students not only get a theoretical understanding of the concepts but also gain practical programming skills through the exercises. The course covers object oriented programming in Java as well as declarative programming in (e.g.) Haskell. Moreover, the syntax and operational semantics of these languages is formally described. In detail the following topics are explained: overview of programming languages landscape; Java: objects, classes, methods, attributes, variables, class diagrams, visibility, types, statements, expressions, method calls, recursion, arrays, inheritance, late binding, interfaces, graphical user interfaces, frameworks (e.g. Swing), inner classes, exception handling, generics, wrapping of basic values, enumeration types, JUnit, file handling, garbage collection, applets, threads, synchronization, general programming principles, stepwise refinement; declarative language (e.g. Haskell): algebraic data types, pattern matching, type inference, higher-order functions, Currying, lazy evaluation; operational semantics: strict vs. non-strict operations, program translation, intermediate code. The goal is that the students learn the main programming concepts and programming techniques and that they get some programming experience through the accompanying exercises.

Themes	Learning objectives
Concepts of programming languages	To understand the concepts of programming languages and to be able to apply them appropriately in practical software development.
Programming techniques	To understand the programming techniques and to be able to apply them appropriately in practical software development. To be able to transform a

		textual specification of a small program or module into a running implementation. To get some first experience with team work.
	Semantics of programming languages	To deepen the understanding of the programming concepts and to get used to and appreciate formal methods.

5

Learning outcomes:
Academic:
Students shall master the programming in the small, i.e. the implementation of a specification of a program or module.
Soft skills:
In the exercises the students cooperate in small groups of students (e.g. 3). This strengthens their ability to work in a team.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	120 min.	100 %

9

Study Work:

No	Number and Type; Connection to Course	Duration
1	Exercises	max 60 pages

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	2.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.50 CP
Study Work	No 1	1.50 CP
Total		9 CP

12

Weight of the module grade for the overall grade:
5.17% (9 of 174 CP)

13

Module Prerequisites:
none

14	**Presence:** Presence is strongly recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Programming
		No 2: Exercises on Programming
16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** School of Business and Economics
17	**Misc.:**	

Mathematics for IS

Module Title english:	Mathematics for IS				
Course Program:	Bachelor Information Systems				
1	**Module No:** QM1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 1	**CP:** 9	**Workload (h):** 270

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Calculus for B&E	Compulsory	30 h (2 CH)	60
2	Lecture	Linear Algebra for B&E	Compulsory	15 h (1 CH)	30
3	Exercise	Tutorial on Mathematics for B&E	Compulsory	45 h (3 CH)	90

4 **Module Contents:**

Background and relations to other courses:

Mathematics are fundamental in every kind of quantitative study of business and economics. Mathematical skills are essentially needed, e.g., in Statistics, Operations Management and Finance. There are no prerequisites except a thorough knowledge of school mathematics, in particular differential and integral calculus for functions of one variable (which, however, will be briefly repeated in the Adjustment course). The tutorial offers all students the opportunity to work on the lecture-topics in small groups guided by experienced students.

Main topics and learning objectives:

Themes	Learning objectives
Calculus in one variable	To refresh and adapt school knowledge of functions of one variable, in particular differential and integral calculus. To apply this knowledge to introductory quantitative economical questions.
Systems of Linear Equations	To understand how to translate linear dependencies between economical variables into systems of linear equations and how to solve them. To find optimal solutions.
Vectors and Operations with Vectors	To learn how to mathematize economic profiles by means of vectors and how to do and interpret elementary operations with vectors, such as linear combinations and projections.
Matrices and Operations with Matrices	To use matrices as mathematical models of linear economical mappings between groups of economical variables. To do basic operations such as products of matrices, matrix inverses, determinants and eigenvalues of matrices and to understand how these operations are used in quantitative economics.

	Series	To characterize economical series by means of implicit and explicit formulas. To sum up finite and infinite series. To understand the interrelation between power series and functions of one variable. To make use of the geometric series in financial mathematics.
	Differential Calculus	To understand how functions of several variables are used in quantitative economics. To learn the role of partial/directed/total derivatives as tools describing variational properties of those functions. To use implicit derivatives. To understand the interrelation between curvature of functions and their second-order-derivatives
	Nonlinear Optimization	To use derivatives of functions in optimization of economically motivated differentiable functions. To understand the treatment of differentiable restrictions in optimization (Lagrange-method). Finally, to investigate the influence of exogenous variables on the optimal solution.

5

Learning outcomes:
Academic:
the student should demonstrate the ability

- to do mathematical calculations such as optimizations and solutions of economical equations which are necessary in further economical analyses.
- to mathematize economical problems, that is find mathematical structure in those problems

Soft skills:
Reading and understanding formal texts (like mathematical formulas in economics), Working in small groups (self study) in order to solve mathematical problems, Presentation Skills (when visiting the tutorial)

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Electronic exam	90 min.	100 %

9 **Study Work:**

No	Number and Type; Connection to Course	Duration
1	Exercises	in total a maximum of 45 pages

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	0.50 CP

		No 3	1.50 CP
	Relevant Work	No 1	4.00 CP
	Study Work	No 1	2.00 CP
	Total		9 CP

12	**Weight of the module grade for the overall grade:** 5.17% (9 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Presence is strongly recommended to warrant learning success

15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	Bachelor Business Administration, Bachelor Economics
	English translation of module components from section 3	No 1: Calculus for B&E
		No 2: Linear Algebra for B&E
		No 3: Tutorial on Mathematics for B&E

16	**Responsible Lecturer:** Dr. Ingolf Terveer, Prof. Dr. Heike Trautmann	**Department:** Münster School of Business and Economics
17	**Misc.:** It is strongly recommended to work on the course-topics continuously as they build upon each other during the whole course. An application to the tutorial is necessary, as the number of participants per (parallel) group is limited. For lecture and refreshment course, no application is needed. For successful work in the tutorial, a thorough recapitulation of lecture contents is strictly necessary. Therefore, the self-study-workload of the lecture and the tutorial cannot be strictly separated from each other.	

Introduction to Business Administration, Fundamentals of Finance

Module Title english:		Introduction to Business Administration, Fundamentals of Finance			
Course Program:		Bachelor Information Systems			
1	**Module No:** BWL1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 1	**CP:** 9	**Workload (h):** 270

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Fundamentals of Investments	Compulsory	15 h (1 CH)	30
2	Lecture	Fundamentals of Corporate Finance	Compulsory	15 h (1 CH)	30
3	Exercise	Tutorial Fundamentals of Finance	Compulsory	30 h (2 CH)	60
4	Lecture/ Exercise	Introduction to Business Administration	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

The module consists of two parts, namely an introduction to business administration the finance and investment part. It is the base for further business and economics modules. In the finance area it is the first of two introductory finance courses. The students know the basics of business administration and now learn how to deal with investment and financing decisions. They are introduced to the main concepts in finance; the module lays the foundation for more detailed analyses of the financial decisions of investors and companies in subsequent courses.

Main topics and learning objectives:

In the introductory business administration part, coordination via markets and hierarchies is first discussed on the basis of institutional economics. Then, the various business functions in companies are presented. References to microeconomics are repeatedly made. Important topics also include corporate governance, financial markets, how companies trade in markets, and corporate social responsibility. The special challenges for companies arising from digitalization will be included. The module further covers the fundamentals of finance. Its focus is on investment and financing decisions. It provides the microeconomic foundations of rational investment decision making. Students learn the most important valuation methods to evaluate investment decisions and apply them to practical problems. A particular emphasis is given to the net present value method. In addition, the module discusses the pricing of stocks and bonds. It also discusses the financing of companies with equity and debt and discusses the basic principles of capital structure.

5

Learning outcomes:

Academic:

The module provides a broad overview about the core areas in business management. The students know the basic concepts and methods in finance. They are able to make decisions on investment projects. They are able to identify, discuss and judge the main ways to raise capital. They know the basics of pricing stocks and bonds. They are able to apply the concepts to qualitative and quantitative problems. They are also able to discuss ethical problems related to finance.

Soft skills:

The students acquire the knowledge through a combination of lecture, preparation and follow-up on the lecture material, and tutorials. They are guided to search for information on their own, using various sources including library, journals, internet, etc. The solution of the exercises is actively discussed and moderated in tutorials. The students can solve basic problems in finance and justify their solutions. They can apply theoretical concepts to solve practical problems. Furthermore, they are able to participate in the public and political discussions on finance related topics.

6

Description of possible electives within the modules:
none

7

Examination: Examinations for every part of the module

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam on Introduction to Business Administration No. 1)	60 min.	33.3 %
2	Written exam on Finance and Investment (No. 2)	90 min.	66.7 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	0.50 CP
	No 2	0.50 CP
	No 3	1.00 CP
	No 4	1.00 CP
Relevant Work	No 1	2.00 CP
	No 2	4.00 CP
Total		9 CP

12

Weight of the module grade for the overall grade:
5.17% (9 of 174 CP)

13	**Module Prerequisites:** none	
14	**Presence:** Presence is strongly recommended to warrant learning success.	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	Bachelor Economics
	English translation of module components from section 3	No 1: Fundamentals of Investments
		No 2: Fundamentals of Corporate Finance
		No 3: Tutorial Fundamentals of Finance
		No 4: Introduction to Business Administration
16	**Responsible Lecturer:** Prof. Dr. Nicole Branger, Professor Dr. Peter Kajüter, Prof. Dr. Andreas Pfingsten, Professor Dr. Christoph Watrin	**Department:** Münster School of Business and Economics
17	**Misc.:**	

Data Management

Module Title english:	Data Management				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI2	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Data Management	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Data Management	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

A suitable conceptual design, data-processing design, and implementation of databases are critical success factors for the implementation of application systems. On the one hand, the module Datenmanagement builds on preliminary conceptual aspects of the module Einführung in die Wirtschaftsinformatik, where the data view of the architecture of integrated information systems becomes the focus of consideration. On the other hand, the module Datenmanagement forms the necessary basis for many other modules, in particular with regard to data modeling. The students will learn comprehensive methodological knowledge about conceptual design, data-processing design, and implementation of the data view.

Main topics and learning objectives:

The students learn to methodologically design and implement the data view of information systems. In doing so, the three levels of conceptual design, data-processing design, and implementation are investigated successively. The conceptual design is based on the modeling of data using the language constructs of the entity-relationship model (entity types, relationship types, reinterpreted relationship types, cardinalities in the min-max notation, specializations/generalizations, hierarchies/heterarchies, modeling of Data Warehouse systems). At the data-processing design level, the relational data model is investigated (mathematical relations, first to fifth normal forms). At the implementation level, the focus is on the use of Structured Query Language (SQL) (Data Description Language, Data Manipulation Language, Data Control Language, and Query Language); NoSQL aspects are outlined. The relationships between the three levels are worked out. Transaction concepts (ACID) and locking mechanisms (two-phase locking protocol) to ensure data consistency in multi-user environments are covered. Some in-depth aspects in the field of database management systems (e.g., Data Warehousing) are taught (possibly through scientific or practical guest lectures). Applied teaching methods are lectures, exercises, and case studies using the database management system MySQL or a similar relational database system. As part of the exercises, the students will give short presentations of their results.

Themes	Learning objectives

	Conceptual design	To model business requirements regarding the data of information systems using entity relationship models.
	Data-processing design	To transform the conceptual design into relational data models; to apply normal forms of database design.
	Implementation	To implement the conceptual and the data-processing design using a relational database; to use the Structured Query Language for addressing business requirements
	Transactional aspects and locking mechanisms	To use common functionalities of relational database management systems (RDBMS), especially transactional aspects and locking mechanisms

5

Learning outcomes:

Academic:

The students are able to structure, model, and implement the data processing components of information systems on the basis of a traditional methodological approach of common database management systems. Furthermore, the students develop a basic understanding of the functions of multi-user database management systems.

Soft skills:

The students learn and deepen problem solving in small groups as well as presentation techniques regarding their exercise results.

6

Description of possible electives within the modules:

none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final Written Exam	120 min.	100 %

9

Study Work:

No	Number and Type; Connection to Course	Duration
1	Solving a case study	

10

Prerequisites for Credit Points:

The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	3.00 CP
Study Work	No 1	1.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)	
13	**Module Prerequisites:** none	
14	**Presence:** Presence during the lectures and active participation in the accompanying group work is highly recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Data Management
		No 2: Tutorial Data Management
16	**Responsible Lecturer:** Prof. Dr. Dr. h.c. Jörg Becker	**Department:** School of Business and Economics
17	**Misc.:**	

Data Structures and Algorithms

Module Title english:	Data Structures and Algorithms				
Course Program:	Bachelor Information Systems				
1	**Module No:** Inf2	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 2	**CP:** 9	**Workload (h):** 270

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Data Structures and Algorithms	Compulsory	60 h (4 CH)	90
2	Exercise	Exercises on Data Structures and Algorithms	Compulsory	30 h (2 CH)	90

4 **Module Contents:**

Background and relations to other courses:

The knowledge acquired in this lecture is a prerequisite for the modules “Software Engineering,” “IT Systems”, “Security of Distributed Systems”, “Project Seminar”, and the Bachelor thesis. The module presupposes basic programming and mathematical skills as conveyed in the modules “Programming” and “Mathematics for Economists”.

Main topics and learning objectives:

Data structures specify the elementary layout variants of data in (main and secondary) memory of computers. Their key aspects concern creation, usage, and maintenance of the respective structure. Furthermore, they are central to the design of various algorithms, which form the foundation of various applications in computer science. In this lecture, a representative selection of data structures (such as lists, trees, heaps, graphs, stacks, queues, hash structures) as well as fundamental algorithms (such as searching and sorting, routing in graphs, tree algorithms, string matching) are presented. Essential aspects are, on the one hand, the development of analysis and evaluation techniques of algorithms and, on the other, the shaping of the ability to discriminate between “efficiency” and “inefficiency.” The latter paves the way towards so-called NP-complete problems and their approximate treatment. Besides the lecture, exercises are offered. Students are aware of fundamental algorithms to make best use of data structures. They are able to apply them competently, in particular with respect to efficiency. Furthermore, they are able to develop new algorithms and to determine their complexity.

Themes	Learning objectives
Representative selection of data structures	• Explain layout of and differences between discussed data structures. • Construct and apply suitable data structures for given scenarios.

		• Evaluate different data structures for given scenarios (e.g., in view of memory requirements and running time of relevant algorithms).
	Fundamental algorithms	• Apply and program algorithms. • Develop new algorithms.
	Analysis and evaluation of algorithms	• Explain the notion of efficiency. • Analyze and evaluate algorithms (e.g., in terms of their complexity).

5

Learning outcomes:
Academic:
Evaluation, selection, and application of suitable data structures and algorithms for given scenarios.
Soft skills:
Independent and team work to discuss and solve algorithmic problems. Presentation of devised solutions in small groups.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	120 min.	100 %

9

Study Work:

No	Number and Type; Connection to Course	Duration
1	Course Assignments	max. of 60 pages

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	2.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.50 CP
Study Work	No 1	1.50 CP
Total		9 CP

12

Weight of the module grade for the overall grade:
5.17% (9 of 174 CP)

13	**Module Prerequisites:** none	
14	**Presence:** Presence is strongly recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Data Structures and Algorithms
		No 2: Exercises on Data Structures and Algorithms
16	**Responsible Lecturer:** Prof. Dr. Fabian Gieseke	**Department:** School of Business and Economics
17	**Misc.:**	

Operations Research

Module Title english:		Operations Research			
Course Program:		Bachelor Information Systems			
1	**Module No:** QM2	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Operations Research	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Operations Research	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

The module "Operations Research" provides students with mathematically based and often algorithmically executed instruments that can be used to solve numerous business management problems effectively and efficiently. It thus forms the basis for almost all modules with at least a partial quantitative orientation applications. Only knowledge to the extent of the module "Business Mathematics" is required.

Main topics and learning objectives:

Themes	Learning objectives
Basics in Optimization	Students know that application problems can ideally be transformed into abstract models and formally described. They are also able to distinguish between simple and hard problems due to runtime complexity in standardized machine models and have insights into the basics of complexity theory.
Graphs and Trees	The students are able to model and solve graph-theoretical problems from application and theory. Furthermore, the students are able to transfer basic methods of optimization for graphs to new problems.
Linear Optimization	The students are able to describe and solve linear optimization problems (general and integer). They have gained deep insight into the basic problems and the derivation of standard methods such as the simplex algorithm and variants. In addition, they are able to model and solve special application problems of the problem class of linear integer optimization.
Nonlinear Optimization	Students can identify, model, and solve nonlinear problems. In addition to understanding basic numerical methods in one dimension, students can apply deterministic (often heuristic) methods.

	Computer-aided Optimization: Students will be able to implement selected methods of optimization from the areas of graphs/trees, linear optimization and nonlinear optimization by means of a programming language and thus solve given problems. Competences in at least one programming language suitable for rapid prototyping of algorithms (e.g. Python) have been acquired.
5	**Learning outcomes:** **Academic:** Students will be able to transfer practical problems into mathematical models of operations research. They also have methodological knowledge to solve these problems (sometimes almost) optimally and to assess the methods used with regard to their applicability and limitations. **Soft skills:** Perseverance in addressing quantitative problems, critical thinking about problems and solution procedures, presentation skills (in the context of small group tutorials or equivalent digital formats), teamwork skills (in the context of group work).
6	**Description of possible electives within the modules:** none
7	**Examination:** Examinations for every part of the module

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	90 min.	100 %

9 **Study Work:**

No	Number and Type; Connection to Course	Duration
1	Homework	approx. 30 pages

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	3.00 CP
Study Work	No 1	1.00 CP
Total		6 CP

12 **Weight of the module grade for the overall grade:**
3.45% (6 of 174 CP)

13 **Module Prerequisites:**
none

14	**Presence:** Presence is strongly recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Operations Research
		No 2: Tutorial Operations Research
16	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** School of Business and Economics
17	**Misc.:**	

Foundations of Accounting

Module Title english:	Foundations of Accounting				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL2	**State:** Compulsory	**Language of Instruction:** German		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 2	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Accounting	Compulsory	45 h (3 CH)	75
2	Exercise	Tutorial on Accounting	Compulsory	15 h (1 CH)	45

4 **Module Contents:**

Background and relations to other courses:

The module "Foundations of Accounting" conveys basic knowledge of financial and managerial accounting and shows the links and interrelationships between both sub-areas. It illustrates how the business activities of companies are recorded in accounting systems, how companies use accounting information to manage their business and how they report on their business activities with the help of the financial statements. This imparts knowledge that is not only fundamental to the modules “Management Accounting” as well as “Financial Accounting and Taxation”, but is also applied in many other modules. The lecture "Accounting" is supplemented by a tutorial. This comprises two elements: a tutorial in small groups and a plenary tutorial. Both serve to apply and deepen the acquired knowledge by means of practical problems. Digital learning tests and online courses complement the course.

Main topics and learning objectives:

The part on financial accounting deals with annual financial statements according to the German Commercial Code (HGB). It includes the basic principles of bookkeeping. Students learn how business activities are recorded using double-entry bookkeeping and how they are reflected in the balance sheet, income statement and cash flow statement. In addition, recognition and measurement rules for financial statements are discussed. Finally, students gain insights into the analysis of financial statements based on ratios, e.g. from the perspective of lenders. The part on management accounting focuses on cost accounting as a controlling instrument. Among other things, the operating income statement, the costing of products and services, and the variance analysis in cost centers are covered. Students learn how business decisions are made and how employee behavior is influenced by the use of cost information. Insights into cost management complete the course. The aim of the module is to teach students "the language of business" and to promote their business thinking and action.

5 **Learning outcomes:**

Academic:

Students will be familiar with the basic principles of financial and management accounting. They are able to record business activities in the balance sheet and income statement and to prepare financial statements. Students will also be able to analyse financial statements using ratios. This

	enables them to assess the financial position and financial performance of a company. In the area of management accounting, students have a basic knowledge of cost accounting (cost type, cost center and cost unit accounting), can apply this to practical problems and interpret the results. Overall, students are able to critically question and discuss individual aspects of accounting. **Soft skills:** The module enables students to expand their interdisciplinary skills in relation to the sub-areas of accounting. The accompanying tutorials also contribute to this. In addition, the tutorials promote the students' discussion skills and their ability to work in a team during discussions. Finally, the module promotes the systemic competencies of the students through self-study. These include, in particular, time and self-management.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	max. 120 min.	100 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

Presence	No 1	1.50 CP
	No 2	0.50 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Presence is strongly recommended to warrant learning success.
15	**Mobility/Acknowledgement:**

Use of the module for other course programs	Bachelor Business Administration, Bachelor Economics, Bachelor Information Systems, Bachelor Mathematics, Bachelor Physics, Master Business Chemistry

	Module Title english	Foundations of Accounting
	English translation of module components from section 3	No 1: Accounting
		No 2: Tutorial on Accounting
16	**Responsible Lecturer:** Professor Dr. Peter Kajüter	**Department:** School of Business and Economics
17	**Misc.:**	

Business Process Management

Module Title english:	Business Process Management				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI3	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Business Process Management	Compulsory	30 h (2 CH)	60
2	Exercise	Exercises in Business Process Management	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

5 **Learning outcomes:**

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written Exam	120 Min	100 %

9 **Study Work:**

No	Number and Type; Connection to Course	Duration
1	Solving case studies	maximum 15 pages

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP

	Relevant Work	No 1	3.00 CP
	Study Work	No 1	1.00 CP
	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)		
13	**Module Prerequisites:** none		
14	**Presence:** Presence is urgently recommended		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	Bachelor Business Administration	
	English translation of module components from section 3	No 1: Business Process Management	
		No 2: Exercises in Business Process Management	
16	**Responsible Lecturer:** Prof. Dr. Dr. h.c. Jörg Becker	**Department:** University of Münster, School of Business and Economics	
17	**Misc.:**		

IT-Law

Module Title english:	IT-Law				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI4	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture/ Exercise	IT-Law	Compulsory	60 h (4 CH)	120

4 **Module Contents:**

Background and relations to other courses:

The knowledge of IT-specific legal knowledge is indispensable within all quantitative subject fields of business informatics. Previous knowledge from other modules is not required.

Main topics and learning objectives:

Themes	Learning objectives
Distance selling law	knowledge of legal peculiarities of contracts concluded on the Internet, duty to inform b2b, b2C
IT contract law	knowledge and contents of contracts concerning IT transactions, classification and application of conventional contract types of the German Civil Code, e.g. the contract of sale, service contract and the lease contract by reference to the peculiarities of the IT law, main features of defects liability in software law, content control and the design of typical IT contracts
Data protection law	origins and constitutional background of data privacy law, overview and illustration of rationales of data privacy law on the basis of the Federal Data Protection Act (BDSG) with emphasis on data handling in privacy, rights of the persons concerned, data privacy law within the framework of the German Teleservices Act (GTA), features and peculiarities of the German Teleservices Act with regard to general data protection law and the rights of the persons involved, duties of an internal commissioner for data protection and freedom of information
Copyright law	acquaintance with the structure of copyright law, the author and the authorised user, copyright in employment, peculiarities of computer programmes

	Trademark law, especially domain law	differentiation between name, business denomination and trademark, characteristics of domain law, trademarks in the social web

5

Learning outcomes:
Academic:
At the end of the module, the students have gained a sound overview over the German and the European law system and the capability to recognise IT-specific legal problems, and are therefore in a position to address these towards the respective decision-maker in their future professional field or in project consulting. The students should be able to solve simple legal cases on their own or to take appropriate measures in order to counteract and to eliminate the previously identified legal problems.
Soft skills:
Perseverance in the familiarisation with an entirely new subject field and the ability to apply abstract norms to real-life scenarios; teamwork (within the scope of joint case-solving); knowledge of legal norms and the structure of the German and European law systems.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	120 min.	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	2.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3.45% (6 of 174 CP)

13

Module Prerequisites:
none

14

Presence:
Presence is strongly recommended to warrant learning success

15

Mobility/Acknowledgement:

	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: IT-Law
16	**Responsible Lecturer:** Prof. Dr. Ulrich Luckhaus	**Department:** School of Business and Economics
17	**Misc.:**	

Software Engineering

Module Title english:	Software Engineering				
Course Program:	Bachelor Information Systems				
1	**Module No:** Inf3	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3	**CP:** 6	**Workload (h):** 180

3

Module Structure:

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Software Engineering	Compulsory	45 h (3 CH)	30
2	Exercise	Tutorial Software Engineering	Compulsory	15 h (1 CH)	90

4

Module Contents:

Background and relations to other courses:

Software Engineering conveys the skills to develop large software systems. It assumes that the students have passed the course on Programming and that they have hence obtained the required programming experience. Software Engineering skills will be required in e.g. different practical courses as well as for the bachelor thesis.

Main topics and learning objectives:

The aim of this course is that students shall be enabled to develop large software systems in teams. The corresponding management concepts and technical skills will be conveyed. The course covers the main tasks of the software engineering life cycle, namely planning, requirements definition and analysis, design, implementation, and testing. Particular emphasis will be placed on UML modelling, middleware, and design patterns. Moreover, process models (such as UP, Scrum and XP) for software engineering will be presented.

Themes	Learning objectives
Planning	To learn the basic concepts of planning a software project such as e.g. cost prediction and scheduling.
Requirements definition and analysis	To specify the requirements of a software system and develop a corresponding UML model.
Design	To decompose the overall functionality of a software system into a system of interacting components and relationships between them. Know the most important design patterns and be able to apply them to solve design problems.
Implementation	To implement a software design using a programming language.
Testing	To guarantee the quality of the developed software.

	Process models: To structure the software development process appropriately.
5	**Learning outcomes:** **Academic:** Students shall be enabled to develop large software systems systematically. **Soft skills:** The students solve the exercises in teams of (e.g.) 5 students. This strengthens their ability to work together and develop software in teams.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	120 min.	100 %

9	**Study Work:**

No	Number and Type; Connection to Course	Duration
1	Exercises	max 30 pages

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

Presence	No 1	1.50 CP
	No 2	0.50 CP
Relevant Work	No 1	3.00 CP
Study Work	No 1	1.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Presence is strongly recommended to warrant learning success
15	**Mobility/Acknowledgement:**

Use of the module for other course programs	none

	English translation of module components from section 3	No 1: Software Engineering No 2: Tutorial Software Engineering
16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** School of Business and Economics
17	**Misc.:**	

Data and Probability

Module Title english:	Data and Probability				
Course Program:	Bachelor Information Systems				
1	**Module No:** QM3	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Data and Probability	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial for Data and Probability	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

In IT supported business, juge amount of data emerges which is to be exploited in order to improve processes etc. Th module first discusses “data” and, subsequently, deals with som purely data driven techniques. Generalising statements inevitably requires a probability model. To this end, the module introduces the mathematical basics of probability theory in IS-studies. Probability models are fundamental in economical practice – in science as well as in business. Especially, “Data Analytics and Simulation”, but also specialization courses like “Stochastics in Finance”, make intensive use of probability calculus. As a prerequisite, knowledge of the contents of “Mathematics for IS” should be thorough.

Main topics and learning objectives:

Themes	Learning objectives
Descriptive Statistics: Data, Scales	To get acquainted with data sources, the statistical meaning of numbers and data representations. To be able to determine partitions by hierarchical clustering.
Probabilities, random variables	To learn about the assessment of uncertainty and to master the language of probability theory. To investigate probabilities by means of distributional measures based on distribution function and expectation
Conditioning, Independence	To understand how probabilities are to be reassessed if (real or hypothetical) information is available To deal with events and random quantities that are mutually uninformative.
Limit theorems	To grasp the meaning of the (strong) law of large numbers resp. the Glivenko-Cantelli theorem
Interdependencies Statistical Software tools	To get insight to probability models for multivariate data, i.e. data with several attributes. To understand how the dependence between attributes can be quantified theoretically and empirically. To be familiar

	with (at least) one statistical package (such as "R"). To use this package in solving statistical problems that arise in applications.

5

Learning outcomes:
Academic:
The student should demonstrate the capability to handle moderate probability models describing economical problems. Furthermore, the student should understand the interrelation between theoretical models and empirical data – e.g., by means of limit theorems.
Soft skills:
Reading and understanding formal texts using probability-language. Working in small groups (self study) in order to solve mathematical problems.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	90 min.	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3.45% (6 of 174 CP)

13

Module Prerequisites:
none

14

Presence:
Presence is strongly recommended to warrant learning success

15

Mobility/Acknowledgement:

Use of the module for other course programs	none
	No 1: Data and Probability

	English translation of module components from section 3	No 2: Tutorial for Data and Probability
16	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** School of Business and Economics
17	**Misc.:**	

Operations Management

Module Title english:	Operations Management				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL3	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Operations Management	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Operations Management	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

Operations Management covers the management of production and service processes in companies and is rooted in the functional area of operations. The processes considered in this functional area are closely related to processes of marketing, controlling and financial management, which are considered in other modules. For example, it is important for the inventory management of products to know the sales campaigns planned in Marketing. This module provides an introduction to operations management. Using selected practical case studies, it shows the areas of application of Operations Management, imparts its basic qualitative and quantitative methods and describes the successful use of these methods within a company. In the tutorial, tasks are used to apply the lectures' contents to concrete problems and deepen the students' knowledge. Students should have successfully completed the first and second semester. With regard to other courses, knowledge from the lecture "Analysis for Economists" as well as "Statistics I" is recommended.

Main topics and learning objectives:

The core objective of this module is to teach the most important qualitative and quantitative methods under the below themes.

Themes	Learning objectives
Forecasting and Demand Planning	Be able to distinguish between the different types of quantitative and qualitative models. Be able to determine and apply a forecast model suitable for the data at hand. Be able to assess the quality of forecasts.
Location Planning	Learn and be able to apply various approaches to making different decisions in location planning.
Process Design	Learn to model, evaluate, and improve processes using various approaches. Be able to apply basic elements of queuing theory in process design.

	Quality Management	Understand the importance of quality management and learn different approaches to it. Learn the use of control charts in quality management and be able to determine if a process meets required tolerance limits.
	Inventory Management	Understand the various functions of inventory and the objectives of inventory control. Be able to apply various techniques to determine the frequency and level of orders. Understand the interaction of inventory management with demand forecasting and how it relates to the overall supply chain.
	Production Planning	Understand the different approaches to production planning, such as manufacturing resource planning as well as just-in-time production and lean manufacturing. Be able to perform the steps of Manufacturing Resource Planning.
	Scheduling Operations	Know the objectives of scheduling and be able to apply the respective methods, e.g., distributing tasks to different processing stations and determining the order in which they are processed. Know and be able to apply different approaches to route planning.

5

Learning outcomes:
Academic:
The student should demonstrate the ability to reproduce his knowledge about the concepts and methods of Operations Management, to apply that knowledge to a new context, and to integrate and apply the taught themes.
Soft skills:
By preparing and reviewing the lecture contents and tasks given in the exercise in workgroups during their self-study, students improve their team work skill. This is supported by a Learnweb discussion forum that is guided by the chair. Furthermore, this course increases their ability to understand formal texts (like mathematical formulas) and to solve quantitative tasks.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	90 min.	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP

	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)		
13	**Module Prerequisites:** Students should have successfully passed the first and the second semester, especially the lectures “Mathematics for IS” and “Operations Research”.		
14	**Presence:** Presence is strongly recommended to warrant learning success		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	Bachelor Business Administration, Bachelor Economics, Bachelor Information Systems	
	English translation of module components from section 3	No 1: Operations Management	
		No 2: Tutorial Operations Management	
16	**Responsible Lecturer:** Prof. Dr.-Ing. Bernd Hellingrath	**Department:** School of Business and Economics	
17	**Misc.:**		

Digital Work & Project Management

Module Title english:	Digital Work & Project Management				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI5	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Digital Collaboration: Tools and Concepts	Compulsory	15 h (1 CH)	30
2	Lecture	The public and academic discourse on digital work	Compulsory	15 h (1 CH)	30
3	Lecture	Project Management	Compulsory	15 h (1 CH)	30
4	Exercise	Exercises in Project Management	Compulsory	15 h (1 CH)	30

4 **Module Contents:**

Background and relations to other courses:

Digitalization has had and continues to have a profound impact on work: from the individual practices of work, collaborative and distributed work and division of labor, novel human-machine constellations, ways of organizing work, up to macro level effects on labor productivity and employment. Yet our understanding of the changing nature of work and the implications for the individual, organizations, societies and the economy remains poorly developed. Therefore, the course combines a reflection on the transformation of work as it is mirrored in the public and academic discourse with an introduction into project work and project management, which has become the prevailing form of work in IT related professions. Fundamental knowledge of project management is an essential part of conducting (IT) projects. Project management will provide students with an understanding of the toolset for the work environment of IT professions, and will be helpful during the planning and work on their Bachelor and Master theses. The teaching methods include lectures, software tutorials and student assignments. Within the assignments, students need to form groups and apply the gained knowledge to solve tasks that have references to real-world project management scenarios.

Main topics and learning objectives:

The first part of the course emphasizes alternative scenarios of technology supported work: intended change, possible side-effects, related structural changes. A key rationale of this course is to provide students with a mature and actionable understanding of the emerging landscape of work in light of stakeholder interests. The second part of the course focuses on the dissemination of fundamental knowledge of management of (IT) projects. It provides an overview of the entire project life cycle, including such stages as initiating, planning, executing, monitoring and controlling, as well as closing a project. Project management methods and tools are introduced in

	the lectures and are applied in the software tutorials and student assignments. Guest lectures by industry representatives will provide insights into practice projects.

Themes	Learning objectives
Digital transformation of work	To develop an in-depth conceptual and practical understanding of the domains of digital work and project management.
Organization and governance of work	To critically examine the relationship between technology development and other forces shaping the understanding, organization and management of work.
Introduction to (IT) Project Management	To understand the main concepts in (IT) project management and the differences between projects and routines.
Project Life Cycle Management	To understand the project life cycle and internal and external factors influencing projects.
Management of the Project "Magic Triangle": Scope, Schedule, and Cost	To understand how to manage each of the dimensions of the project "Magic Triangle", namely scope, schedule, and cost, as well as to know the main underlying processes and to be able to apply the relevant methods and tools.
Project Quality Management	To understand how to manage quality in projects, as well as to know the main underlying processes and to be able to apply the relevant methods and tools.
Project Resource Management	To understand how to manage a project team and all project resources, as well as to know the main underlying processes and to be able to apply the relevant methods and tools.
Project Communications Management	To understand how to manage communication(s) in projects, as well as to know the main underlying processes and to be able to apply the relevant methods and tools.
Project Risk Management	To understand how to manage risks in projects, as well as to know the main underlying processes and to be able to apply the relevant methods and tools.
Specialized Topics in (IT) Project Management	To deepen knowledge of particular topics in (IT) project management, such as knowledge management and document management in projects, agile methods for (IT) project management, multi-project management, project closing and self-management.
Tutorials on Project Management Software	To gain hands-on experience with project management software (such as Microsoft Project and Jira).

5	**Learning outcomes:** **Academic:** Participants understand key disciplinary approaches and concepts related to the technology-induced transformation of work, in particular collaborative and distributed work. Draw on wider public and academic debates to explore contentious issues related to (the future of) digital work. Students are able to apply stakeholder and discourse analysis and engage in a classroom debate. Students understand the main concepts in (IT) project management, as well as gain knowledge of some specialized topics in this field. They understand how to manage (IT) projects and know the main processes in project management. They are able to apply methods and tools to solve tasks

	that have references to real-world project management scenarios, as well as are able to use project management software. **Soft skills:** Gain experience in group work, problem-solving, academic writing, presenting, discussing and debating. Improve passive and active English language skills in both written and oral form. Gain basic experience with project management software. Foster independent work and self studies. Connect with IT professionals in the industry.
6	**Description of possible electives within the modules:** none
7	**Examination:** Examinations for every part of the module
8	**Relevant Work:** **No** | **Number and Type; Connection to Course** | **Duration** | **Part of final mark in %** 1 | Written Exam | max 120 min | 75 % 2 | Exercise (groups of 4 - 5 students): written script | 4000 words | 25 %
9	**Study Work:** **No** | **Number and Type; Connection to Course** | **Duration** 1 | Project Management Assignments: group presentation (groups of approx. 5 students) | 20 min
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:** **Presence** | No 1 | 0.50 CP **Presence** | No 2 | 0.50 CP **Presence** | No 3 | 0.50 CP **Presence** | No 4 | 0.50 CP **Relevant Work** | No 1 | 3.00 CP **Relevant Work** | No 2 | 0.50 CP **Study Work** | No 1 | 0.50 CP **Total** | | 6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none

14	**Presence:** Presence is strongly recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Digital Collaboration: Tools and Concepts
		No 2: The public and academic discourse on digital work
		No 3: Project Management
		No 4: Exercises in Project Management
16	**Responsible Lecturer:** Prof. Dr. Stefan Klein, Dr. rer. nat. Raimund Vogl	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

IT-Systems

Module Title english:	IT-Systems				
Course Program:	Bachelor Information Systems				
1	**Module No:** Inf4	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	IT Systems	Compulsory	30 h (2 CH)	60
2	Exercise	Exercises in IT-Systems	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

This module presents foundations of IT systems, from the architecture of typical von Neumann computers via their management by operating systems to their operations in cloud environments with virtualization techniques. Students are guided from Boolean functions to adders, multiplexers, and memory chips, which in combination result in a von Neumann computer, which is discussed from a modern perspective. Based on this understanding of computer hardware, the course then deals with the fundamentals of operating systems. Operating systems provide elementary functionality that interact “downwards” with specific hardware and provide “upwards”, for applications, hardware independent and abstract services that do not need to be implemented individually. Typical functionality and services include resource and memory management, process management and processor scheduling, and I/O. Subsequently, this module focuses on abstraction via virtualization in cloud environments to manage complex IT systems. Thus, the module forms the basis for understanding hardware and software interactions in larger IT systems.

Main topics and learning objectives:

Students develop a solid background of computer structures, operating systems, and virtualization. Students learn to translate problems into Boolean functions, to design functional units for sample problems, and to discuss the fundamental von Neumann concept. They are able to discuss architectures, concepts, and components of operating systems and virtualization and to apply typical management tasks in sample scenarios.

Themes	Learning objectives
Boolean functions, multiplexers, adders	Design and use components of modern computers.
Von Neumann architecture	Explain the fundamental computer architecture and discuss its performance aspects.
Assembler programming	Explain and write simple procedures in this field of programming.

Operating system architecture, processes, threads	Discuss major architectures and components of modern OSs; explain and contrast processes and threads and their roles for OSs and applications.
Scheduling, I/O, virtual memory	Explain OS data structures, algorithms, and management techniques.
Concurrency, mutual exclusion	Analyze programming challenges arising from concurrency and apply appropriate techniques addressing these challenges.
Virtualization	Explain concepts from virtualization to serverless computing, perform typical management tasks.

5

Learning outcomes:
Academic:
Solid understanding regarding the computer organization of computers and IT systems and the interaction of hardware, virtualization, and operating software.
Soft skills:
Independent and interactive work with real systems and simulation tools, individually as well as in groups.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written Exam	90 min	100 %

9

Study Work:

No	Number and Type; Connection to Course	Duration
1	Exercises (Homework)	ca 30 pages

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	3.00 CP
Study Work	No 1	1.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3.45% (6 of 174 CP)

13	**Module Prerequisites:** none	
14	**Presence:** none	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: IT Systems
		No 2: Exercises in IT-Systems
16	**Responsible Lecturer:** Prof. Dr. Fabian Gieseke, Dr. Jens Lechtenbörger	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

Data Analysis

Module Title english:	Data Analysis				
Course Program:	Bachelor Information Systems				
1	**Module No:** QM4	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Data Analysis	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial on Data Analysis	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

This module is based on the introductory module "Data and Probability". It covers the fundamentals of statistical data analysis to investigate business processes. To this end, software tools for statistical analysis are investigated during the courses. The techniques covered are basic in forthcoming modules focusing on empirical data. In particular, seminars in Quantitative Methods often employ tools and methods for statistical testing.

Main topics and learning objectives:

Themes	Learning objectives
Model selection and pertaining techniques	To grasp the role of conditional distribution in the context of data analysis. Subsequently, to get acquainted with the standard techniques of model selection: parameter estimation (method of moments, maximum likelihood) and testing statistical hypotheses. To be familiar with basic techniques how to calculate distributions of test statistics.
Input-Output Analysis, explanation and forecasting	To get familiar with the standard problems of inductive data (metric and categorical regression resp. classification) and the classical procedures. To regard I/O-problems in the general context of conditioning. To use conditional expectation as a fundament of explanation.
Statistical Software tools	To gain more experience with (at least) one statistical package (such as "R"). To use this package in solving statistical problems that arise in applications.

5 **Learning outcomes:**

Academic:

The Students know/can apply fundamental statistical methods in IS. He/she is capable of modeling queuing systems in mathematical terms.

Soft skills:

	Reading and understanding formal texts using probability-language. Working in small groups (self study) in order to solve mathematical problems, Presentation Skills (when visiting the tutorial). Knowledge of common Software-Tools in Statistics.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:** **No** | **Number and Type; Connection to Course** | **Duration** | **Part of final mark in %** 1 | Written Exam | 90 min | 100 %
9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:** **Presence** | No 1 | 1.00 CP **Presence** | No 2 | 1.00 CP **Relevant Work** | No 1 | 4.00 CP **Total** | | 6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Presence is strongly recommended to warrant learning success.
15	**Mobility/Acknowledgement:** **Use of the module for other course programs** | none **English translation of module components from section 3** | No 1: Data Analysis **English translation of module components from section 3** | No 2: Tutorial on Data Analysis
16	**Responsible Lecturer:** Prof. Dr. Heike Trautmann **Department:** University of Münster, School of Business and Economics
17	**Misc.:**

Systems Analysis and Decision Making

Module Title english:	Systems Analysis and Decision Making				
Course Program:	Bachelor Information Systems				
1	**Module No:** QM5	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Systems Analysis and Decision Making	Compulsory	30 h (2 CH)	60
2	Exercise	Exercises in Systems Analysis and Decision Making	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

The module "Systems Analysis and Decision Making" equips students with methods of simulation, advanced optimization as well as basics of decision theory and knowledge in concepts of game theory. This will enable them to model real-world problems and use these models as a basis for optimization processes as well as decision-making processes. Knowledge of basic optimization and skills in programming acquired in the scope of the Operations Research module are required. In addition, the module builds on basic knowledge of probability theory acquired in the module "Data and Probabilities".

Main topics and learning objectives:

Upon completion of the module, students will have acquired knowledge on the following topics:

Themes	Learning objectives
Systems and Models	Students are able to explain the concept of a system and the process of systems analysis. In doing so, they are able to specify and justify terms like real system, modeling, prediction, and evaluation for a given system.
Simulation	Students have a broad knowledge of simulation methods and classes of simulations. They are also able to abstract a given real system and formulate it in a suitable simulation model. They also have the necessary skills for a computer-based implementation of such models.
Advanced Concepts of Optimization	The students have a sound knowledge of advanced (also heuristic) methods of optimization. In addition to understanding established deterministic methods and their applications, students can prepare problems and models for the use of randomized methods and apply these methods.

	Decision Theory	Students are able to describe and distinguish decision-making problems. They have a basic knowledge of methods for decision making and can critically evaluate approaches and results of decision making. They are also able to establish the connection between optimization and decision theory and to methodically consider optimization in the decision context (especially under multiple objectives).
	Game Theory	Students have a basic understanding of game theory as a generalization of decision theory and are familiar with the most important aspects of strategic and cooperative games.

5

Learning outcomes:
Academic:
Students will be able to abstract real-world decision problems, transfer them into a simulation model and optimize them depending on the field of application. In addition, they acquire competencies in prescriptive (normative) decision-making and are able to master dynamic decision scenarios in terms of game theory (competitive and cooperative) on a mathematical-algorithmic level.
Soft skills:
Perseverance in addressing quantitative problems, critical thinking about problems and solution procedures, presentation skills (in the context of small group tutorials or equivalent digital formats), teamwork skills (in the context of collaborative group work).

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written Exam	60 min	100 %

9

Study Work:

No	Number and Type; Connection to Course	Duration
1	Exercises (Homework), eventually in a digital format	ca 50 pages

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	3.00 CP
Study Work	No 1	1.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)	
13	**Module Prerequisites:** Attendance is strongly recommended to improve learning success.	
14	**Presence:** none	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Systems Analysis and Decision Making
		No 2: Exercises in Systems Analysis and Decision Making
16	**Responsible Lecturer:** Prof. Dr. Heike Trautmann	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

Seminar Bachelor IS 1

Module Title english:	Seminar Bachelor IS 1				
Course Program:	Bachelor Information Systems				
1	**Module No:** Sem1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Seminar	Scientific Writing	Compulsory	24 h (1 CH)	124
2	Seminar	Presentation technique	Compulsory	12 h (0 CH)	20

4 **Module Contents:**

Background and relations to other courses:
The IS seminar allows the students to deepen their knowledge and skills in a particular area of information systems, computer science or quantitative methods. The students can choose from a variety of offered specializations. The contents and methods taught in the compulsory courses are prerequisites for an IS seminar.

Main topics and learning objectives:
The IS seminar enables students to deepen their knowledge and skills in a specific area of information systems, computer science or quantitative methods. In addition, the students get experience in reading scientific literature, scientific writing and presenting advanced topics to an audience. Tutors assist the students in individual meetings in all of these steps.

Themes	Learning objectives
(e.g.) algorithms, data science, programming languages, software engineering, modelling	knowing and being able to apply concepts and methods of a specialized IS topic
Scientific texts	Reading and understanding scientific literature. Writing scientific texts about an advanced IS topic in a structured, understandable and precise way.
Presentation	Orally present the content of the written scientific text using state-of-the-art presentation tools (such as Powerpoint or LaTeX) and defend positions during the discussion

5 **Learning outcomes:**
Academic:
Knowing and being able to apply concepts and methods of a specialized IS topic.

	Soft skills: (among others) media competence, time management, rhetoric, presentation skills.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Presentation of a written seminar paper including final discussion within the group	ca 20 pages, max. 60 min	100 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

Presence	No 1	0.50 CP
	No 2	0.50 CP
Relevant Work	No 1	5.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Physical attendance is mandatory in order to present the content of the written scientific text and to discuss it with fellow students and the teacher. An attendance of at least 80 % is required.
15	**Mobility/Acknowledgement:**

Use of the module for other course programs	none
English translation of module components from section 3	No 1: Scientific Writing
	No 2: Presentation technique

16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** University of Münster, School of Business and Economics

17	**Misc.:** Overall, two seminars have to be successfully completed.

Seminar Bachelor IS 2

Module Title english:	Seminar Bachelor IS 2				
Course Program:	Bachelor Information Systems				
1	**Module No:** Sem2	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Seminar	Scientific Writing	Compulsory	24 h (1 CH)	124
2	Seminar	Presentation technique	Compulsory	12 h (0 CH)	20

4 **Module Contents:**

Background and relations to other courses:
The IS seminar allows the students to deepen their knowledge and skills in a particular area of information systems, computer science or quantitative methods. The students can choose from a variety of offered specializations. The contents and methods taught in the compulsory courses are prerequisites for an IS seminar.

Main topics and learning objectives:
The IS seminar enables students to deepen their knowledge and skills in a specific area of information systems, computer science or quantitative methods. In addition, the students get experience in reading scientific literature, scientific writing and presenting advanced topics to an audience. Tutors assist the students in individual meetings in all of these steps.

Themes	Learning objectives
(e.g.) algorithms, data science, programming languages, software engineering, modelling	knowing and being able to apply concepts and methods of a specialized IS topic
Scientific texts	Reading and understanding scientific literature. Writing scientific texts about an advanced IS topic in a structured, understandable and precise way.
Presentation	Orally present the content of the written scientific text using state-of-the-art presentation tools (such as Powerpoint or LaTeX) and defend positions during the discussion

5 **Learning outcomes:**
Academic:
Knowing and being able to apply concepts and methods of a specialized IS topic.

	Soft skills: (among others) media competence, time management, rhetoric, presentation skills.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Presentation of a written seminar paper including final discussion within the group	ca 20 pages, max. 60 min	100 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

Presence	No 1	0.50 CP
	No 2	0.50 CP
Relevant Work	No 1	5.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** Physical attendance is mandatory in order to present the content of the written scientific text and to discuss it with fellow students and the teacher. An attendance of at least 80 % is required.
15	**Mobility/Acknowledgement:**

Use of the module for other course programs	none
English translation of module components from section 3	No 1: Scientific Writing
	No 2: Presentation technique

16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** University of Münster, School of Business and Economics

17	**Misc.:** Overall, two seminars have to be successfully completed.

Digital Business

Module Title english:	Digital Business				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI6	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 5	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Digital Business	Compulsory	30 h (2 CH)	45
2	Exercise	Digital Business: Course Assignments, Presentations & Discussion	Compulsory	30 h (2 CH)	75

4 **Module Contents:**

Main topics and learning objectives:

Digital Business is thriving and is making significant inroads in business and everyday life. In fact, doing business digitally has become an integral part of everyday life for public and private organisations, both large and small, across the globe. The course introduces business modelling and business model innovation. It reflects business transformation, including disruptive innovation, illustrated by current examples. As such the course combines an entrepreneurial (firm) perspective and a market perspective, by examining constellations of actors in a market environment. Given the increasing exposure of businesses to security threats, the course will provide a brief introduction into theoretical and practical security, security strategy and privacy.

Themes	Learning objectives
Digital Business and the Information Society	To learn about current debates on the social, economic and political role of digital innovation. To be able to critically assess the impact of digital innovations and underlying mechanisms.
Business modelling and business model patterns	To understand the building blocks of business models, to be able to reconstruct existing business models and to develop a business model.
Business transformation	To comprehend the customer buying cycle and the notion of CRM. To assess the role of Prosuming and service configuration.
Security and privacy	To comprehend basic mechanisms of encryption and privacy protection and how they can be used for electronic communication.

5 **Learning outcomes:**
Academic:

	Upon completion of the course, students will be able to a) characterize the building blocks and pattern of business models, b) identify and critically examine mechanisms of disruptive innovation, c) assess the impact of digital innovation from the perspective of different stakeholders, d) understand and contribute to current debates about privacy, personalization, net and search neutrality, social cost and benefits of digital innovation. **Soft skills:** The student should demonstrate the ability • to productively work in groups and • to coordinate with peers.
6	**Description of possible electives within the modules:** none
7	**Examination:** Examinations for every part of the module
8	**Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam	60 min.	50 %
2	in groups: Case study (written script with (video-)presentation)	max. 20 pages / max. 20 minutes	50 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	2.00 CP
	No 2	2.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** Working Knowledge of English
14	**Presence:** Presence is strongly recommended to warrant learning success
15	**Mobility/Acknowledgement:**

	Use of the module for other course programs	Bachelor Business Administration, Bachelor Information Systems
	English translation of module components from section 3	No 1: Digital Business
		No 2: Digital Business: Course Assignments, Presentations & Discussion
16	**Responsible Lecturer:** Prof. Dr. Stefan Klein	**Department:** School of Business and Economics
17	**Misc.:** This course is intended to be a seminar rather than a lecture course and, as such, the primary responsibility for learning will rest with the students. The philosophy behind the course is that the combination of reading, thinking, writing, presenting, discussing, and listening is highly effective for learning. Participation in well-prepared and thoughtful discussions is a powerful way of gaining an appreciation for the critical issues relating to the development and impact of electronic business and more generally an Internet Economy and Society. Consequently, the main class activity will be discussion. Students are expected to come to class having read the assigned reading materials, be prepared to discuss the major issues presented in the readings and to debate their (management) implications. The quality of students learning experience will depend on the extent of their motivation, initiative, preparation for class, and participation during class. The instructor's role will be to support the learning experience by providing a course structure, course materials, mini-lectures, facilitating the discussions, and providing feedback on the student's work.	

IT-Driven Innovation

Module Title english:	IT-Driven Innovation				
Course Program:	Bachelor Information Systems				
1	**Module No:** WI7	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 5	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	IT-Driven Innovation	Compulsory	30 h (2 CH)	60
2	Exercise	Exercises in IT-Driven Innovation	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

5 **Learning outcomes:**

6 **Description of possible electives within the modules:**
none

7 **Examination:** Examinations for every part of the module

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written Exam	120 min	70 %
2	Case study (written script with (video-)presentation) in groups of ca 5 persons	max. 20 pages / max. 20 minutes	30 %

9 **Study Work:** none

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
	No 1	3.00 CP

	Relevant Work	No 2	1.00 CP
	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)		
13	**Module Prerequisites:** none		
14	**Presence:** none		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	none	
	English translation of module components from section 3	No 1: IT-Driven Innovation	
		No 2: Exercises in IT-Driven Innovation	
16	**Responsible Lecturer:** Prof. Dr. Dr. h.c. Jörg Becker	**Department:** University of Münster, School of Business and Economics	
17	**Misc.:**		

Introduction to Economics for IS

Module Title english:	Introduction to Economics for IS				
Course Program:	Bachelor Information Systems				
1	**Module No:** VWL1	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 5	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Economics for IS: lecture	Compulsory	30 h (2 CH)	60
2	Exercise	Economics for IS: tutorial	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:

With increasing significance, success in business on more complex, especially digital, markets relies on a deeper understanding of the basic conditions of functioning markets and their normative foundations in a modern democratic society. Therefore, this course introduces economics as a key strand of the social sciences, leading to a fundamental understanding not only of the economy but of social phenomena in general. The students develop a critical understanding of the basic concepts underpinning the science of economics in its microeconomic and macroeconomic branches. They also acquire the competency to apply the fundamental concepts and ethical challenges of a market-based economy in democracy to issues of strategic management. The microeconomic unit deals with individual choice under scarcity and with the design of incentives through institutions, including markets for digital commodities where peculiarities on the supply or demand side may play a major role. The macroeconomic unit addresses basic macroeconomic policy issues.

Main topics and learning objectives:

The course explains basic concepts of economics, including micro economics, macroeconomics, economic policy, and both their methodical and ethical foundations.

Themes	Learning objectives
Fundamentals of Economics	Ability to apply fundamental principles of economic reasoning (e.g., scarcity, opportunity cost, thinking at the margin) to decisions in business
Normative foundations of markets	Understanding the normative prerequisites of making business in democracy and knowing how to apply them to issues of strategic management
Scarcity and individual choice, markets and competition	Understanding of the conditions of functioning markets, ability to apply conceptual knowledge to decisions in business, especially in the digital economy

	The larger economy	Understanding and applying basic macroeconomic concepts

5

Learning outcomes:
Academic:
By the end of the course, the students are able to apply fundamental economic concepts to issues they will encounter in business.
Soft skills:
By the end of the course, the students have acquired a deeper understanding of the ethical foundations of markets, and they are enabled to apply the concepts of individual and corporate responsibilities in practice.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final Written Exam	90 min.	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3.45% (6 of 174 CP)

13

Module Prerequisites:
none

14

Presence:
Presence is strongly recommended to warrant learning success

15

Mobility/Acknowledgement:

Use of the module for other course programs	none
English translation of module components from section 3	No 1: Economics for IS: lecture
	No 2: Economics for IS: tutorial

16	**Responsible Lecturer:** Professor Dr. Gernot Sieg	**Department:** School of Business and Economics
17	**Misc.:** Regular work on the course topics is strongly recommended as they are closely related towards one another.	

Approved Internship

Module Title english:	Approved Internship				
Course Program:	Bachelor Information Systems				
1	**Module No:** WPr	**State:** Elective	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1		Internship and corresponding documentation	Compulsory	0 h (0 CH)	180

4 **Module Contents:**

Background and relations to other courses:
The students are assumed to know and be able to apply the concepts and methods taught in the compulsory courses. The experience gained in the internship can be helpful when writing the bachelor thesis.

Main topics and learning objectives:
The approved internship offers students the chance to gain practical experience during their study. The core area of the internship shall be Information Systems, Quantitative Methods, Computer Science or Business Administration. After the internship, the participants have to write a report documenting how they solved the practical problem which was assigned to them. In addition, they have to present their solution in a talk using contemporary presentation tools (such as e.g. Powerpoint). The subject of the internship has to be confirmed by the tutor before the internship begins. Depending on the subject, ethical aspects will be covered.

Themes	Learning objectives
Internship	Independently getting acquaintanted with a complex task. Independent application of learned methods and concepts to solve a practical problem.
Report	Describing the developed solution of the given problem in a well-structured, understandable, and precise way in a scientific paper.

5 **Learning outcomes:**

Academic:
The students gain experience w.r.t. the practical application of the concepts and methods learned in their study. They learn to align theoretical approaches and practical experience.

Soft skills:
The students learn to write scientific texts and present their contents orally using contemporary presentation tools (such as e.g. Powerpoint). The required skills such as (among others) media competence, time management, rhetoric, and presentation technique are conveyed in a private discussion with a tutor. Depending on the subject, ethical aspects will be covered.

6 **Description of possible electives within the modules:**
none

7 **Examination:** Examinations for every part of the module

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Report and Presentation	20 pages, 30 min	100 %

9 **Study Work:** none

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	0.00 CP
Relevant Work	No 1	6.00 CP
Total		6 CP

12 **Weight of the module grade for the overall grade:**
3.45% (6 of 174 CP)

13 **Module Prerequisites:**
none

14 **Presence:**
Presence at the collaborating enterprise is mandatory.

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	none
English translation of module components from section 3	No 1: Internship and corresponding documentation

16 **Responsible Lecturer:**
Prof. Dr. Herbert Kuchen

Department:
School of Business and Economics

17 **Misc.:**
The rules of the examination office have to be taken into account when applying for an internship. Moreover, the subject of the internship has to be confirmed by the tutor, before the internship begins.

Marketing Management

Module Title english:		Marketing Management				
Course Program:		Bachelor Information Systems				
1	**Module No:** BWL 3	**State:** Compulsory	**Language of Instruction:** English			
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 1 or 2	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Marketing Management	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial on Marketing Management	Compulsory	30 h (2 CH)	60

4 **Module Profile:**

Purpose of the module/integration into curriculum

This course is an introductory lecture into marketing. It thus forms the basis for further marketing courses.

Course content:

This course provides a basic introduction to aspects of strategic and operational marketing as well as the specific objectives and instruments of marketing.

Themes	Learning objectives
Marketing and Decision-Making	To comprehend the complex relationship of marketing and strategic, institutional decision making.
Marketing Strategies	To learn to understand marketing as a complex process of strategic decision making steps in a competitive economic system.
Strategic Decision Problems	To understand, differentiate, and analyze distinctive components of decision making in marketing practice.
Brand Management	To understand basic branding strategies. To describe basic options of branding architecture options (focus is on brand transfer).
Product Development	To describe basic steps when developing new products based on customers' needs.
Pricing	To know factors and methods that influence pricing. To compute optimal prices for specific market conditions.
Distribution	To describe basic steps when implementing new distribution strategies.
Communication	To describe basic elements when creating communication strategies. To understand factors that influence the effectiveness of advertising campaigns.

5

Learning outcomes:
Academic:
After completing the course, students have a sound basic knowledge of marketing. Based on the knowledge students acquired throughout the course, the students are able to classify and structure marketing challenges and make recommendations for management decisions. The students know various methods and instruments to solve marketing-relevant problems. Furthermore, the students have knowledge of latest developments in strategic and operative marketing.
Soft skills:
The students have an overview of relevant problem areas in marketing (extending knowledge). In addition, students can apply the knowledge they have acquired in developing marketing strategies and develop situation-specific problem solutions (instrumental competence). In addition, students learn to exchange information and problems and develop joint approaches to solutions (communicative skills).

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	90 min.	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3,3%

13

Module Prerequisites:
none

14

Presence:
Attendance is strongly recommended to warrant learning success

15

Mobility/Acknowledgement:

	Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration, Bachelor Mathematics, Master Physics
16	**Responsible Lecturer:** Professor Dr. Thorsten Wiesel	**Department:** School of Business and Economics
17	**Misc.:**	

Management Accounting and Control

Module Title english:		Management Accounting and Control				
Course Program:		Bachelor Information Systems				
1	**Module No:** BWL 5	**State:** Compulsory	**Language of Instruction:** German			
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Management Accounting	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial on Management Accounting	Compulsory	30 h (2 CH)	60

4 **Module Profile:**

Purpose of the module/integration into curriculum

The content of this module is based on the introductory modules taught in the first year of the bachelor program and focuses on the use of cost and revenue accounting for business decisions and control aspects in line with corporate objectives. The module thus forms a cross-sectional function to lectures that illustrate aspects within the value chain of a company (e.g., marketing, sales, or production) and also deals with activities of management consultancies and operative controlling departments in business practice (e.g., corporate planning and budgeting).

Course content:

This module deals with the use of information (especially from cost and revenue accounting) for decision support and behavior control in companies. In the area of decision support, the use of information for price, production, or marketing and sales decisions, which are typically made within the framework of the annual corporate planning and budgeting, is in the foreground. In the area of behavioral control, the vertical and horizontal coordination of departments and actors in companies are involved to align the entire organization with common goals. The focus here is on integrated management systems such as the Balanced Scorecard and their link to incentive systems. With the help of guest lectures, exercises, and supplementary tutorials, relevant topics are deepened and a profound understanding on the part of the students is made possible.

Themes	Learning objectives
Introduction to Controlling	The students understand the importance of controlling as part of the management process and can differentiate between controlling as a function and controllership. Further, they distinguish between decision support and behavior control as central tasks of controlling.
Fundamentals of Cost Accounting	The students understand the importance of cost types, cost centers, and internal cost allocation as prerequisites for cost accounting.

	Allocation of Overhead Costs	The students develop an understanding of the concept of overhead calculations and can apply it in a differentiated manner. Further, the students are able to contextualize the importance of the allocation of overhead costs under the causation principle.
	Process Costing and Process Management	The students learn about the problems associated with traditional overhead calculation and can allocate overhead costs based on process costing. They will also learn about the principles, advantages, limits, and fields of application of process costing.
	Income Statement	The students learn to determine the profit for the period based on the nature and function of the expense method. Further, attention is paid to the different method's impact on the profit for the period. In addition, the students know methods to determine unit costs.
	Approaches to Planning and Budgeting	The students develop an understanding of the contents and the process of planning and budgeting in the company and learn about alternative forms of budgeting (e.g., Beyond and Better Budgeting).
	Operational Planning and Decision within the Scope of Budgeting	The students learn to determine product prices and quantities based on information from cost accounting and are able to make production decisions. In addition, the students know essential aspects of market-related planning (e.g., ABC analysis, portfolio analysis, and customer profitability analysis).
	Break-even Analysis and Operating Leverage	The students know how to extract information from cost accounting to determine break-even points and can assess the operative risk of a company (Operating Leverage).
	Budget consolidation	The students are able to carry out the operative budgeting in a company based on a so-called "master budget".
	Variance Analysis	The students understand how the budgeting process can be controlled and how it is connected to behavioral control. They are able to mathematically identify and interpret the causes of deviations from the plan.
	Management Control 1: Budget-related Incentive Models	The students understand the concept of agency theory and can point out problem areas and possible solutions of budget-related incentive models.
	Management Control 2: Performance Measures and Performance Measurement Systems	The students learn about the characteristics and usefulness of performance measures and performance measurement systems. In addition to financial performance measures, particular attention is paid to non-financial performance measures.
	Controlling-Analytics	The students understand the importance of data-driven corporate management. The focus here is on uncovering critical success drivers, recognizing causal relationships between them, and making management decisions based on them. In addition, the visualization of data for decision-making is addressed.
5	**Learning outcomes:** **Academic:** On successful completion of this module, students are able to - extract relevant information from cost accounting and make decisions from a management perspective. - understand the importance and implementation of a planning and budgeting process. - discuss suitable actions to influence the cost structure of a company and justify decisions in this regard economically. -	

	understand the importance of information asymmetries in coordination processes and are able to identify possible solutions. - apply learned concepts into practical applications of controlling departments. **Soft skills:** On successful completion of this module, students are able to - solve unfamiliar problems based on theoretical frameworks and structured approaches. - understand, critically reflect on, and apply findings from academic literature. - justify their decisions with a clear and logical argumentation. - connect the dots between academic insights and practical applications.
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:** **No** | **Number and Type; Connection to Course** | **Duration** | **Part of final mark in %** 1 | Final written exam | 90 min. | 100 %
9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:** **Presence** | No 1 | 1.00 CP **Presence** | No 2 | 1.00 CP **Relevant Work** | No 1 | 4.00 CP **Total** | | 6 CP
12	**Weight of the module grade for the overall grade:** 3,3%
13	**Module Prerequisites:** Recommended: basic knowledge in accounting.
14	**Presence:** Presence is strongly recommended to warrant learning success.
15	**Mobility/Acknowledgement:** **Use of the module for other course programs** | Bachelor Economics, Bachelor Business Administration, Bachelor Mathematics, Master Physics, Master Business Chemistry
16	**Responsible Lecturer:** Professor Dr. Martin Artz **Department:** School of Business and Economics

17	**Misc.:**

Management & Governance

Module Title english:		Management & Governance				
Course Program:		Bachelor Information Systems				
1	**Module No:** BWL 6	**State:** Compulsory	**Language of Instruction:** German			
2	**Turn:** each winter semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Organization and Management	Compulsory	37.5 h (2 CH)	45
2	Lecture	Corporate Governance	Compulsory	37.5 h (2 CH)	45
3	Exercise	Tutorial on Management & Governance	Compulsory	15 h (1 CH)	30

4 **Module Profile:**

Purpose of the module/integration into curriculum

The module conveys fundamental aspects of Management and Governance

Course content:

The substantive focus is on the areas of organization, business strategy, human resources management (staffing) and corporate governance. Here, the various concepts will be presented and their strengths and weaknesses will be analysed. These concepts will be illustrated on the basis of selected case studies.

Themes	Learning objectives
Organisational Design; Strategic Management; Human Ressource Management	Understanding of the basics of Organization Management
Corporate Governance; Two Tier System; Working Council	Understanding of the basics of Corporate Governance

5 **Learning outcomes:**

Academic:

The students know different forms of organization, different types of strategies, concepts of human resource management (staffing) and systems of corporate governance. They are in the position to evaluate different management- and process-structures in terms of their efficiency.

Soft skills:

none

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	120 min.	100 %

9 **Study Work:** none

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	0.75 CP
	No 2	0.75 CP
	No 3	0.50 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12 **Weight of the module grade for the overall grade:**
3,3%

13 **Module Prerequisites:**
none

14 **Presence:**
Presence is strongly recommended to warrant learning success

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration, Bachelor Mathematics, Master Physics

16 **Responsible Lecturer:**
Professor Dr. Gerhard Schewe

Department:
School of Business and Economics

17 **Misc.:**

Strategy Science

Module Title english:		Strategy Science				
Course Program:		Bachelor Information Systems				
1	**Module No:** BWL 7	**State:** Compulsory	**Language of Instruction:** English			
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180	

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Strategy Science	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Strategy Science	Compulsory	30 h (2 CH)	60

4 **Module Profile:**

Purpose of the module/integration into curriculum

This module provides an introduction to strategic management, with a particular focus on corporate strategy and related empirical-quantitative research. It requires prior knowledge of basic statistics.

Course content:

This module provides fundamental knowledge in the strategic management of companies. It covers fundamental topics such as portfolio management, growth strategies, alliances as well as mergers and acquisitions and provides an overview of the current state of strategic management research. At the same time, students acquire the fundamentals of scientific working based on key milestones of the strategic management literature. In the context of evaluating strategic options, students also learn the basics of quantitative modeling. The practical relevance of the content covered is illustrated by guest lectures and case studies.

5 **Learning outcomes:**

Academic:

Students will - develop a comprehensive understanding of basic theories, concepts and instruments of corporate strategy - critically question the content covered and place it in the context of current empirical research - learn and practice the essential principles of scientific working - acquire the necessary theoretical and methodological knowledge for quantitative modeling of strategic options - deepen the acquired knowledge by means of selected case studies

6 **Description of possible electives within the modules:**

none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %

	1	Written exam	120 min.	75 %
	2	written assignment	maximum of 10 pages	25 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	3.00 CP
	No 2	1.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3,3%
13	**Module Prerequisites:** none
14	**Presence:** Presence is recommended to warrant learning success.

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration

16	**Responsible Lecturer:** Prof. Dr. David Bendig	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

Financial Accounting and Taxation

Module Title english:		Financial Accounting and Taxation				
Course Program:		Bachelor Information Systems				
1	**Module No:** BWL 8	**State:** Compulsory	**Language of Instruction:** German			
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180	

3

Module Structure:

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Financial Accounting	Compulsory	22.5 h (1 CH)	45
2	Lecture	Principles of Corporate Taxation	Compulsory	22.5 h (1 CH)	45
3	Exercise	Tutorial on Financial Accounting	Compulsory	7.5 h (0 CH)	15
4	Exercise	Tutorial on Principles of Corporate Taxation	Compulsory	7.5 h (0 CH)	15

4

Module Profile:

Purpose of the module/integration into curriculum

The course Financial Accounting extends and deepens the contents that have been taught in the field of financial accounting within the compulsory course Foundations of Corporate Accounting. The course "Principles of Corporate Taxation" provides first insights into the field of taxes. In this regard it shows the tax-related consequences of business decisions and, on the other hand, how tax law influences business reality.

Course content:

The module deepens the knowledge of financial accounting in the field of national as well as international individual financial statements and corporate taxation. The focus of the preparation of annual financial statements is on the recognition and measurement regulations with regard to German accounting principles. These regulations are theoretically dealt with, but the objective is also to get a deeper understanding of the topics in question by means of numerous examples. The corresponding principles and rules of the International Financial Reporting Standards (IFRS) are also presented. Moreover, insights into the main features of consolidated financial statements are provided. A balanced interplay between a theoretical basis and the application of the contents taught in the course are consistently pursued. In the field of corporate taxation the basic principles of taxes on income, i.e. income tax, corporation and trade tax as well as potentially the basics of further different types of taxation (e.g. value-added tax) or the General Fiscal Code are covered. The economic effects of the tax standards in question are analysed. The theoretical lecture's contents of the course are illustrated with the help of several exercise elements or practice cases, respectively. The exercises are presented during the lecture and in special tutorial lessons. It is expected that students develop solutions on the respective assignments in advance of the tutorials.

5

Learning outcomes:

Academic:

After having successfully completed the module, students have a profound knowledge of the preparation of individual financial statements based on the German Commercial Code and the tax law. They are aware of the tax implications of different legal forms. They know crucial differences between the systems of accounting rules under German GAAP and IFRS as well as the differences between individual and consolidated financial statements and the tax accounts. Furthermore, students are able to apply the knowledge acquired to practical accounting problems and to assess the effect of taxes on business decisions.

Soft skills:

Having passed the module students are able to analyze theoretical questions in a profound way and identify and solve practical problems in a differentiated way. The students acquire the knowledge through a combination of lecture, pre- and post-preparation on the lecture material and exercises. Students are guided to search for information on their own, e.g. in the library, journals, internet etc. The solutions to the exercises are actively discussed and moderated in practice sessions.

6

Description of possible electives within the modules:
none

7

Examination: Examinations for every part of the module

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam on Financial Accounting	60 min.	50 %
2	Written exam on Principles of Corporate Taxation	60 min.	50 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	0.75 CP
	No 2	0.75 CP
	No 3	0.25 CP
	No 4	0.25 CP
Relevant Work	No 1	2.00 CP
	No 2	2.00 CP
Total		6 CP

12

Weight of the module grade for the overall grade:
3,3%

13	**Module Prerequisites:** Recommended: Knowledge from the module Foundations of Accounting	
14	**Presence:** Presence is recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration
16	**Responsible Lecturer:** Prof. Dr. Hans-Jürgen Kirsch, Professor Dr. Christoph Watrin	**Department:** School of Business and Economics
17	**Misc.:**	

Corporate Finance

Module Title english:	Corporate Finance				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 9	**State:** Compulsory	**Language of Instruction:** English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Corporate Finance	Compulsory	30 h (2 CH)	90
2	Exercise	Tutorial on Corporate Finance	Compulsory	30 h (2 CH)	30

4 **Module Profile:**

Purpose of the module/integration into curriculum

The module "Corporate Finance" analyses financial decision-making in companies with a special focus on the uncertainty of the consequences. This includes capital investment decisions and the question to what extend equity or debt should be used to finance the firm's investment projects. The discussion builds on a thorough understanding of the functioning of financial markets and the valuation of securities and corporations. Learning about asset pricing models will concurrently improve the student's ability to make smart financial decisions. The course lays the groundwork for the elective finance module in the 6th semester which will address the topic "investments" in greater detail. Prerequisite for the course is the comprehension of valuation under certainty.

Course content:

The course introduces students to portfolio theory and develops an understanding of basic principles of asset pricing in financial markets (CAPM). Furthermore, capital structure issues are discussed and the Modigliani-Miller irrelevance theorem is put into perspective. Students will learn how companies should optimally satisfy their financial needs and how investment projects and securities can be valued. Additionally, the students will learn to use and select between different concepts of multi-period business valuation. The tutorial will be partly in class, partly as a online-tutorial that gives students the opportunity to discuss exercises with the tutor as exam preparation.

Themes	Learning objectives
Valuation under uncertainty	To learn about different methods for evaluating alternatives with uncertain consequences and their appropriateness for financial decision-making.
Portfolio Theory	To understand the risk and return characteristics of combinations of financial securities and the effects of diversification.

	Capital Asset Pricing	To learn about the valuation of securities in capital markets and the standard model of market equilibrium.
	Model Cost of capital and capital structure	To identify the pivotal factors in determining the optimal capital structure. To assess a company's cost of capital.
	Business Valuation	To use discounted cash flow methods in business valuation.
	Advanced Business Valuation	To understand multiple period valuation models which allow for changing capital structures and the influence of taxation.

5

Learning outcomes:
Academic:
After completing this module the students have fundamental knowledge about asset pricing concepts in capital markets. They are able to explain relationships between risk, return and cost of capital. They can analyze the effects of a change in the capital structure of a company on the value and the risk of this company. The students can choose and employ suitable valuation approaches for the respective task.
Soft skills:
The self-preparation of the students for the lecture facilitates the ability of the students to manage themselves and their time in a more effective and efficient way. The analysis of complex financial problems helps them to solve problems in a structured way. The interactive character of the lectures and tutorials strengthens the student's discussion-skills in the academic context. As lecture and tutorial are taught in English, the students' 'Business English' proficiency is improved.

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Final written exam	120 min.	100 %

9 **Study Work:** none

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12 **Weight of the module grade for the overall grade:**
3,3%

13	**Module Prerequisites:** Basic knowledge in business administration and economics. Recommended modules: Principles of Business, Foundations of Accounting, Financial Accounting and Taxation, Microeconomics I, Macroeconomics I, Statistics	
14	**Presence:** Presence is recommended to warrant learning success	
15	**Mobility/Acknowledgement:**	
	Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration, Bachelor Mathematics, Master Physics
16	**Responsible Lecturer:** Prof. Dr. Thomas Langer	**Department:** School of Business and Economics
17	**Misc.:**	

Marketing Analytics

Module Title english:	Marketing Analytics				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 10	**State:** Compulsory	**Language of Instruction:** English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 3 or 4	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Market Research	Compulsory	22.5 h (1 CH)	45
2	Lecture	Marketing Operations	Compulsory	22.5 h (1 CH)	45
3	Exercise	Tutorial on Marketing Analytics	Compulsory	15 h (1 CH)	30

4 **Module Profile:**
Purpose of the module/integration into curriculum
The module builts on the contents of the modules Marketing Management, Analysis for B&E, Data Science 1 and Data Science 2.

5 **Learning outcomes:**
Academic:
M

6 **Description of possible electives within the modules:**
none

7 **Examination:** Examinations for every part of the module

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written exam on Market Research (No. 1)	60 min.	50 %
2	Written exam on Marketing Operations (No. 3)	60 min.	50 %

9 **Study Work:** none

10 **Prerequisites for Credit Points:**
The credit points will be granted after all relevant work and study work have been successfully completed.

11	**CP Assignment:**		
	Presence	No 1	0.75 CP
		No 2	0.75 CP
		No 3	0.50 CP
	Relevant Work	No 1	2.00 CP
		No 2	2.00 CP
	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3,3%		
13	**Module Prerequisites:** Recommendation: Modules Marketing Management, Mathematics-/Statistics-Modules		
14	**Presence:** Presence is strongly recommended to warrant learning success		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	Bachelor Economics, Bachelor Business Administration	
16	**Responsible Lecturer:** Professor Dr. Manfred Krafft	**Department:** School of Business and Economics	
17	**Misc.:**		

Entrepreneurial Marketing

Module Title english:	Entrepreneurial Marketing				
Course Program:	Bachelor Information Sstems				
1	**Module No:** BWL 11	**State:** Elective	**Language of Instruction:** English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Entrepreneurial Marketing	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Entrepreneurial Marketing	Compulsory	30 h (2 CH)	60

4 **Module Profile:**

Purpose of the module/integration into curriculum

The module builds on the courses "Marketing Management" and "Marketing Analytics" and deepens context-specific knowledge in the respective domains

Course content:

The aim of the Entrepreneurial Marketing course is to provide students with theoretical and methodological knowledge about the topic Entrepreneurial Marketing. The students gain insights into the challenges of Entrepreneurial Marketing that contribute to the success of new companies.

5 **Learning outcomes:**

Academic:

Upon completion of this course, students are able to...

- understand and explain essential terms, concepts, models, instruments, and methods from the area of services marketing/ entrepreneurial marketing.
- recognize and analyze specific challenges of service provision/ entrepreneurial marketing successfully.

Soft skills:

Upon completion of this course the student is able to...

- solve problems efficiently and in a socially desirable manner in an (international) team; prepare and communicate results of this team work.
- solve topic-specific cases effectively.
- participate and lead topic-specific discussions in English.

6 **Description of possible electives within the modules:**

none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %

	1	Written exam	90 min.	100 %

9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3,3%
13	**Module Prerequisites:** Recommended: Modules "Marketing Management" and "Marketing Analytics".
14	**Presence:** Presence is strongly recommended to warrant learning success.

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	Bachelor Economics, Bachelor Business Adiministration

16	**Responsible Lecturer:** Professor Dr. Thorsten Wiesel	**Department:** School of Business and Economics
17	**Misc.:**	

Human Resource Management & Entrepreneurship

Module Title english:	Human Resource Management & Entrepreneurship				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 12	**State:** Elective	**Language of Instruction:** German		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3

Module Structure:

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Human Resource Management & Entrepreneurship	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Human Resource Management & Entrepreneurship	Compulsory	30 h (2 CH)	60

4

Module Profile:

Course content:

In this module the basic knowledge for a successful Human Resource Management is imparted. A special focus is put on start-ups and newly founded companies. These companies face special challenges in HRM.

Themes	Learning objectives
Recruiting:	• Introduction to employer branding • "War for talents": how can a start-up outperform larger organizations? • Personnel marketing in the start-up phase • Digitalization in recruiting
Assessment:	• Personnel selection according to DIN 33430 for start-ups, including o Job analysis o Psychometric Properties of test procedures o Psychological assessment in personnel selection
HR development:	• Importance of first employees • Methods of HR development • Strategic personnel development in start-ups • Leadership & Teamwork • Increasing innovation
The entrepreneur	• Entrepreneurs as the centrum of an organization? • Requirements for entrepreneurs in HR (e.g. HR laws & regulations)

	• What makes an entrepreneur? Impetus for self-analysis • Psychological constructs related to entrepreneurship : Psychological key competencies in building a company
5	**Learning outcomes:** **Academic:** The following competencies from the field of business psychology and HRM will be taught: • Conception of a successful recruiting strategy for a start-up, as well as the theoretical models background from the field of of an employer branding. • Knowledge for the The process and function of personnel marketing in start-upsselection of the right personnel marketing instruments • Carrying out a How to conduct a job analysis requirements analysis • Acquisition of knowledge about psychometric test instruments for performance and personality measurement • Personnel selection according to DIN 33430 for start-ups. Using examples, the participants are students will be introduced to the application and evaluation of an the test procedures assessment center • Acquisition of Knowledge knowledge of about classical and innovative methods of personnel development, especially for the promotion field of leadership, teamwork, innovation and entrepreneurship Further professional competencies: • Statistical basics of classical test theory (test theory • Statistical models to calculate benefits of recruitment and selection Benefit models of HR selection (e.g., BCG model) • Basics of Machine Learning and NLP in the context of HR selection • Conception of HR strategies **Soft skills:** • Acquisition of knowledge about tatistical training on the basics of psychometric Propertiespsychometric quality criteria. • Assessment and Ccritical classification evaluation of empirical studies in the field of psychology, and business ,and economicsadministration • Acquisition of knowledge of theabout the basic principles of successful HR management in start-ups • Potential analysis with regard to own start-up projects
6	**Description of possible electives within the modules:** none
7	**Examination:** Final Module Exam
8	**Relevant Work:** **No** | **Number and Type; Connection to Course** | **Duration** | **Part of final mark in %** 1 | Written exam | 90 min. | 100 %
9	**Study Work:** none
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.
11	**CP Assignment:**

	Presence	No 1	1.00 CP
		No 2	1.00 CP
	Relevant Work	No 1	4.00 CP
	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3,3%		
13	**Module Prerequisites:** none		
14	**Presence:** Presence is strongly recommended to warrant learning success.		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	Business Administration, Bachelor Economics	
16	**Responsible Lecturer:** Prof. Dr. David Bendig	**Department:** University of Münster, School of Business and Economics	
17	**Misc.:**		

Principles of Entrepreneurship

Module Title english:	Principles of Entrepreneurship				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 13	**State:** Elective	**Language of Instruction:** English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Principles of Entrepreneurship	Compulsory	30 h (2 CH)	60
2	Exercise	Tutorial Principles of Entrepreneurship	Compulsory	30 h (2 CH)	60

4 **Module Profile:**

Purpose of the module/integration into curriculum

This module gives an introduction to the topic of entrepreneurship. Hence, no previous knowledge from other modules is required.

Course content:

This module gives an introduction to the topic of entrepreneurship. The learning content includes fundamentals of entrepreneurship with regard to entrepreneurial decision-making, the creation of business models and the recognition of opportunities and risks. Participants will learn how to think and act entrepreneurial, allowing for the successful implementation of ideas and innovation processes.

5 **Learning outcomes:**

Academic:

The students
- develop a profound understanding of the entrepreneurial mindset
- understand how to manage opportunities and challenges concerning entrepreneurial activities
- develop an understanding of the innovation process
- comprehend the relevance of customer needs for new product development
- understand how to finance the foundation and growth of a new venture

Soft skills:

The students learn how to convince important stakeholders of their idea within a pitch situation (optional)

6 **Description of possible electives within the modules:**

none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %

	1	Written exam	120 min.	100 %
9	**Study Work:** none			
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.			
11	**CP Assignment:**			
	Presence	No 1	1.00 CP	
		No 2	1.00 CP	
	Relevant Work	No 1	4.00 CP	
	Total		6 CP	
12	**Weight of the module grade for the overall grade:** 3,3%			
13	**Module Prerequisites:** none			
14	**Presence:** none			
15	**Mobility/Acknowledgement:**			
	Use of the module for other course programs	Bachelor Business Administration, Bachelor Economics		
16	**Responsible Lecturer:** Prof. Dr. David Bendig		**Department:** University of Münster, School of Business and Economics	
17	**Misc.:**			

Selected Topics in Business 1

Module Title english:	Selected Topics in Business 1				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 14	**State:** Elective	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture/ Exercise	Selected Topics in Business Administration	Elective	60 h (4 CH)	120
2	Seminar	Selected topics in Business Administration	Elective	30 h (2 CH)	150

4 **Module Contents:**
Background and relations to other courses:
The module extends and deepens knowledge in the field of business administration, especially concerning current issues.
Course content:
In this module, current issues in the field of business administration are presented. The courses have varying contents, depending on the current developments and are carried out by different teachers. In the individual courses, tutorial content and case studies are integrated. In so doing particular attention is paid to the fact that the courses fit into the current research areas of business administration. Courses may vary each semester.

5 **Learning outcomes:**
Academic:
The students get to know changing current or specific issues and thereby also specialize depending on their specific area of interest. They learn techniques and methods, building on theoretical foundations that qualify for starting a career in this particular field. Due to the close link between research and teaching in this module, students recognize the direct relation between economic research and timely professional requirements.
Soft skills:
Students learn to critically reflect and discuss current issues in Business.

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

	No	**Number and Type; Connection to Course**	**Duration**	**Part of final mark in %**
	1	Final written exam	max. 120 min.	100 %
9	**Study Work:** none			
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.			
11	**CP Assignment:**			
	Presence	No 1	2.00 CP	
		No 2	1.00 CP	
	Relevant Work	No 1	4.00 CP	
	Total		6 CP	
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)			
13	**Module Prerequisites:** none			
14	**Presence:** See description of the corresponding business administration module.			
15	**Mobility/Acknowledgement:**			
	Use of the module for other course programs		Bachelor Business Administration, Bachelor Economics	
	English translation of module components from section 3		No 1: Selected Topics in Business Administration	
			No 2: Selected topics in Business Administration	
16	**Responsible Lecturer:** Prof. Dr. Dr. h.c. Jörg Becker		**Department:** School of Business and Economics	
17	**Misc.:**			

Selected Topics in Business 2

Module Title english:	Selected Topics in Business 2				
Course Program:	Bachelor Information Systems				
1	**Module No:** BWL 17	**State:** Elective	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture/ Exercise	Selected Topics in Business Administration	Elective	60 h (4 CH)	120
2	Seminar	Selected topics in Business Administration	Elective	30 h (2 CH)	150

4 **Module Contents:**
Background and relations to other courses:
The module extends and deepens knowledge in the field of business administration, especially concerning current issues.
Course content:
In this module, current issues in the field of business administration are presented. The courses have varying contents, depending on the current developments and are carried out by different teachers. In the individual courses, tutorial content and case studies are integrated. In so doing particular attention is paid to the fact that the courses fit into the current research areas of business administration. Courses may vary each semester.

5 **Learning outcomes:**
Academic:
The students get to know changing current or specific issues and thereby also specialize depending on their specific area of interest. They learn techniques and methods, building on theoretical foundations that qualify for starting a career in this particular field. Due to the close link between research and teaching in this module, students recognize the direct relation between economic research and timely professional requirements.
Soft skills:
Students learn to critically reflect and discuss current issues in Business.

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

	No	**Number and Type; Connection to Course**	**Duration**	**Part of final mark in %**
	1	Final written exam	max. 120 min.	80 %
	2	Oral exam or presentation (might be in groupps)	max. 30 min.	20 %
9	**Study Work:** none			
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.			
11	**CP Assignment:**			
	Presence	No 1	2.00 CP	
		No 2	1.00 CP	
	Relevant Work	No 1	3.00 CP	
		No 2	1.00 CP	
	Total		6 CP	
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)			
13	**Module Prerequisites:** none			
14	**Presence:** See description of the corresponding business administration module.			
15	**Mobility/Acknowledgement:**			
	Use of the module for other course programs	Bachelor Business Administration, Bachelor Economics		
	English translation of module components from section 3	No 1: Selected Topics in Business Administration		
		No 2: Selected topics in Business Administration		
16	**Responsible Lecturer:** Prof. Dr. Dr. h.c. Jörg Becker	**Department:** School of Business and Economics		
17	**Misc.:**			

Selected Chapters in Computer Systems

Module Title english:	Selected Chapters in Computer Systems				
Course Program:	Bachelor Information Systems				
1	**Module No:** AKI	**State:** Elective	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 5 or 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture/ Exercise	L/E as described below (see (6))	Compulsory	60 h (4 CH)	120

4 **Module Contents:**
Background and relations to other courses:
To deepen their insights in computer science, students take courses according to 6-CP-modules in computer science
Main topics and learning objectives:
see the module descriptions which can be found in the pertaining examination regulations.

5 **Learning outcomes:**

6 **Description of possible electives within the modules:**
Students take one of the following modules/courses:

i. Computernetze und ihre Leistung
ii. Eingebettete Systeme
iii. Data Mining
iv. Effiziente Algorithmen
v. Formale Methoden der Softwareentwicklung
vi. Compilerbau
vii. Mustererkennung und Maschinelles Lernen
viii. Methoden und Anwendungen für randomisierte Systeme
ix. Einführung in die Künstliche Intelligenz

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Written Exam	max. 120 minutes	100 %

9 **Study Work:**

	No	**Number and Type; Connection to Course**	**Duration**
	1	Exercises	max. 60 pages
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.		
11	**CP Assignment:**		
	Presence	No 1	2.00 CP
	Relevant Work	No 1	2.00 CP
	Study Work	No 1	2.00 CP
	Total		6 CP
12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)		
13	**Module Prerequisites:** none		
14	**Presence:** none		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	none	
	English translation of module components from section 3	No 1: L/E as described below (see (6))	
16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** University of Münster, School of Business and Economics	
17	**Misc.:** As extracurricular studies, the following modules taken from Geoinformatics can be chosen as well: i. Geoinformatik 1: Grundlagen ii. Geoinformatik 2: Digitale Kartographie		

Security of Distributed Systems

Module Title english:	Security of Distributed Systems				
Course Program:	Bachelor Information Systems				
1	**Module No:** Inf5	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each summer semester	**Duration:** 1 semester	**Semester:** 6	**CP:** 6	**Workload (h):** 180

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Lecture	Security of Distributed Systems	Compulsory	30 h (2 CH)	60
2	Exercise	Exercises in Security of Distributed Systems	Compulsory	30 h (2 CH)	60

4 **Module Contents:**
Main topics and learning objectives:

Themes	Learning objectives
Architecture of distributed systems	Understanding concepts of distributed systems corresponding to the ISO/OSI model and the internet model.
Attack vectors on distributed systems	Identifying security vulnerabilities in networked systems. Understanding exploits and attacks.
Defense measure for distributed systems	Application of effective countermeasures to defend against attacks and exploits. Mitigation of security vulnerabilities.

5 **Learning outcomes:**

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Case study	ca 20 pages	100 %

9 **Study Work:** none

10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.

11 **CP Assignment:**

Presence	No 1	1.00 CP
	No 2	1.00 CP
Relevant Work	No 1	4.00 CP
Total		6 CP

12	**Weight of the module grade for the overall grade:** 3.45% (6 of 174 CP)
13	**Module Prerequisites:** none
14	**Presence:** none

15 **Mobility/Acknowledgement:**

Use of the module for other course programs	none
English translation of module components from section 3	No 1: Security of Distributed Systems
	No 2: Exercises in Security of Distributed Systems

16	**Responsible Lecturer:** Prof. Dr.-Ing. Thomas Hupperich	**Department:** University of Münster, School of Business and Economics
17	**Misc.:**	

Project Seminar

Module Title english:	Project Seminar				
Course Program:	Bachelor Information Systems				
1	**Module No:** PS	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 6	**CP:** 12	**Workload (h):** 360

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1	Seminar	Project Work	Compulsory	60 h (4 CH)	120
2	Seminar	Project Management	Compulsory	30 h (2 CH)	60
3	Seminar	Presentation	Compulsory	30 h (2 CH)	60

4 **Module Contents:**

Background and relations to other courses:
The material and methods learned in the previous courses shall be applied in a practice-oriented project to solve a realistic, complex problem. The project is often performed in collaboration with a partner from industry. The experience gained in the project seminar will be helpful for the bachelor thesis.

Main topics and learning objectives:
The material and methods learned in previous courses are applied in a practice-oriented project. In particular teamwork, project planning and management, development of a business concept, design of a corresponding software architecture, implementation, and testing will be trained. Moreover, the intermediate and final results of the project will be presented using state-of-the-art tools. The participants also have to read relevant literature and describe required concepts in papers. The students are supported in all these activities by tutors. Depending on the subject, ethical aspects are taken into account. The documentation of the project includes chapters "Theoretical and technological foundations", "Specification sheet", "Project Plan", "Code resp. Data documentation", "Manual", "Reflexion"

Themes	Learning objectives
Writing scientific papers	Read and understand scientific literature. Describe the read material well-structured, understandably, and precisely in own words in a paper.
Presentation	Present the material described in the paper orally using state-of-the-art tools (such as e.g. Powerpoint) in a well-structured, understandable, and precise way.
Project work	Solve a realistic task in a project team.

	Project management	Manage a project taking into account limited time and resources. Divide a complex task into activities and assign them to team members. Coordinate the activities in the project.

5

Learning outcomes:
Academic:
Solution of a complex practice-oriented problem.
Soft skills:
(among others) ability to work in a team, ability to communicate and cooperate, leadership skills, media competence, time management, take ethical aspects into account.

6

Description of possible electives within the modules:
none

7

Examination: Final Module Exam

8

Relevant Work:

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Group work: Project documentation and following presentation	max 200 pages, max. 4 hours	100 %

9

Study Work: none

10

Prerequisites for Credit Points:
The credit points will be granted after all relevant work and study work have been successfully completed.

11

CP Assignment:

Presence	No 1	2.00 CP
	No 2	1.00 CP
	No 3	1.00 CP
Relevant Work	No 1	8.00 CP
Total		12 CP

12

Weight of the module grade for the overall grade:
6.9% (12 of 174 CP)

13

Module Prerequisites:
none

14

Presence:
Presence is mandatory

15

Mobility/Acknowledgement:

	Use of the module for other course programs	none
	English translation of module components from section 3	No 1: Project Work
		No 2: Project Management
		No 3: Presentation
16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** School of Business and Economics
17	**Misc.:** Each semester a set of project seminars with different tasks is offered. They will be presented at the end of the previous semester. After that, the available places will be assigned to the interested students.	

Bachelor Thesis

Module Title english:	Bachelor Thesis				
Course Program:	Bachelor Information Systems				
1	**Module No:** BA	**State:** Compulsory	**Language of Instruction:** German or English		
2	**Turn:** each semester	**Duration:** 1 semester	**Semester:** 6	**CP:** 12	**Workload (h):** 360

3 **Module Structure:**

No	Type	Course	State	Workload (h)	
				Presence (h + CH)	**Self-Study (h)**
1		Bachelor Thesis	Compulsory	0 h (0 CH)	360

4 **Module Contents:**

Background and relations to other courses:
The contents of the previous modules will be used in the bachelor thesis.

Main topics and learning objectives:
The bachelor thesis shall demonstrate that the student is able to solve a given, complex problem independently in a given time frame using scientific methods and that he/she is able to describe the solution in a scientific text. The thesis shall have a size of approximately 40 pages.

Themes	Learning objectives
Bachelor thesis	Independently getting acquainted with a complex subject and the corresponding literature. Writing a scientific text. Depending on the subject, ethical aspects will be taken into account.

5 **Learning outcomes:**

Academic:
The students gain experience with the application of the learned material to a complex problem. Moreover, they learn to read the relevant literature and to formulate scientific texts.

Soft skills:
(among others) writing scientific texts, time management, self-competence

6 **Description of possible electives within the modules:**
none

7 **Examination:** Final Module Exam

8 **Relevant Work:**

No	Number and Type; Connection to Course	Duration	Part of final mark in %
1	Bachelor Thesis	40-60 pages	100 %

9	**Study Work:** none		
10	**Prerequisites for Credit Points:** The credit points will be granted after all relevant work and study work have been successfully completed.		
11	**CP Assignment:**		
	Presence	No 1	0.00 CP
	Relevant Work	No 1	12.00 CP
	Total		12 CP
12	**Weight of the module grade for the overall grade:** 6.9% (12 of 174 CP)		
13	**Module Prerequisites:** none		
14	**Presence:** none		
15	**Mobility/Acknowledgement:**		
	Use of the module for other course programs	none	
	English translation of module components from section 3	No 1: Bachelor Thesis	
16	**Responsible Lecturer:** Prof. Dr. Herbert Kuchen	**Department:** School of Business and Economics	
17	**Misc.:**		