

Module Descriptions

for the Bachelor of Science in Information Systems
at the University of Münster
from winter semester 2019/20

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Study plan

Year	Semester	Information Systems	Computer Science	Quantitative Methods	Business Administration	Economics and Law	CP total
1	1	Introduction to IS (3 LCP)	Programming (9 CP)	Mathematics (9 CP)	Foundations of Business Administration (9 CP)		30
	2	Data Management (6 CP)	Data Structures and Algorithms (9 LC)	Operations Research (6 CP)	Foundations of Accounting (9 CP)		30
2	3	Prozess Management (6 CP)	Software Engineering (6 CP)	Data and Probability (6 CP)	Operations Management (6 CP)	Introduction to Economics (6 CP)	30
	4	Project Management (6 CP) Communication and Collaboration Systems (6 CP)	Computer Structures and Operating Systems (9 CP)	Data Analysis and Simulation (9 CP)			30
3	5	Digital Business (6 CP)			Foundations of Marketing (6 CP)	IT-Law (6 CP)	30
		Projekt Seminar (12 CP)					
	6	Specialization Modules (9 CP each) (2 out of 4: IS, CS, QM, Business or documented internship)					30
		Bachelor's thesis (12 CP)					

Introduction to Information Systems

Module Title english:		Introduction to Information Systems			
Course Program:		Bachelor Information Systems			
1	Module No: WI 1	State: Compulsory	Language of Instruction: German, partly English		
2	Turn: each winter semester	Duration: 1 semester	Semester: 1	CP: 3	Workload (h): 90
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH) Self-Study (h)
	1	Lecture	Lecture Series on Information Systems	Compulsory	20 h (1 CH) 40
	2	Lecture	Introduction to Information Systems	Compulsory	10 h (0 CH) 20
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	The module serves as introduction to the scientific discipline Information Systems and forms the basis for all further modules of the bachelor study programme.				
	Course content:				
Accompanied by a practice-oriented case study, which is motivated by a company visit, a lecture series offers different perspectives on Information Systems and applied methods, as being endorsed by the proponents of the Department for Information Systems. Those insights are deepened by lecture-accompanying tasks. Furthermore, first approaches to scientific work are conveyed. Reflections serve as an early analysis of the students interests and their expectation management towards their studies. Additionally, an outlook towards the study programme's lectures and their linked Information Systems topics rounds off the lecture series. Finally, the students receive group mentoring concerning the contents of the Information Systems study programme by fellow students of higher semesters.					
	Themes	Learning objectives			
	Foundations and History of Information Systems	The students are able to delimit the discipline Information Systems from business studies and informatics.			
	Methods of Information Systems	The students acquire the capacity to interdisciplinarily deal with the methods of Information Systems and to link them to the the areas of business studies and informatics.			
	Data- and Process Management	The students acquire the capacity to orient themselves in the data and process landscape of modern organisations.			

	Logistics and Supply Chain Management	The students acquire the capacity to recognise and describe corporate information (material) flows and cash flows and to undertake basic quantitative analyses.										
	Inter- and intra-corporate communications	The students acquire the capacity to describe the basics of inter- and intra-corporate communication and collaboration, to diagnose problems and to work out possible solutions.										
	Software Engineering	The students acquire the capacity to describe process models for a structured software development and to independently										
	Statistics	The students acquire the capacity to understand the necessity of applying statistical methods in Information Systems, and to apply some of them in a rudimentary way.										
	Scientific Work	The students acquire the capacity to work with scientific texts and methods, and to critically discuss and reflect on them.										
	Self-Studies	The students acquire the capacity to learn independently by solving content-related tasks individually, improve their work efficiency by organizing their time management, and improve their media competency by working with different media.										
	Teamwork	By collaborating and communicating with their fellow students during group work, the participants acquire the capacity to interact within a group, and to improve their conflict-solving skills.										
	Presentation	The students acquire the capacity to reproduce content they created themselves, prepared for a specific audience.										
5	<p>Learning outcomes:</p> <p>Academic: The competencies gained in this lecture support students to find orientation at the beginning of their bachelor studies. They gain first knowledge about scientific and practice-related methods of Information Systems.</p> <p>Soft skills: Driven by its structure, this lecture series expects the student to structure the content of the different and partly heterogeneous topics to pass the module. By means of the obligatory presentations, the application of presentation skills will be practiced early. The group work supports the creation of interaction- and communication competences. The mentoring by students from higher semesters enables the exchange of study contents at eye level.</p>											
6	Description of possible electives within the modules: none											
7	Examination: Examinations for every part of the module											
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>none</td> <td></td> <td></td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	none		
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1	none											
9	<p>Study Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Excursion</td> <td>1 day</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	1	Excursion	1 day		
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1	Excursion	1 day										

	2	Mid-term presentation	10 min.																				
	3	Final presentation	10 min.																				
	4	Project documentation	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: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>1.50 CP</td> </tr> <tr> <td>No 2</td> <td>0.50 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>0.00 CP</td> </tr> <tr> <td rowspan="4">Study Work</td> <td>No 1</td> <td>0.25 CP</td> </tr> <tr> <td>No 2</td> <td>0.25 CP</td> </tr> <tr> <td>No 3</td> <td>0.25 CP</td> </tr> <tr> <td>No 4</td> <td>0.25 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>3 CP</td> </tr> </table>			Presence	No 1	1.50 CP	No 2	0.50 CP	Relevant Work	No 1	0.00 CP	Study Work	No 1	0.25 CP	No 2	0.25 CP	No 3	0.25 CP	No 4	0.25 CP	Total		3 CP
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Total		3 CP																					
12	Weight of the module grade for the overall grade: 0 %																						
13	Module Prerequisites: none																						
14	Presence: Participation in all parts of the module is highly recommended. In the lecture "Introduction to Information Systems" participants required to attend both presentations and the excursion, as the success of studies is based upon the attendance and active participation of students. Missing the final presentations is only allowed with good reasons, otherwise the whole module has to be repeated. Missing the excursion with good reasons can be counterbalanced with a thesis on a relevant topic.																						
15	Mobility/Acknowledgement: <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Use of the module for other course programs</td> <td>none</td> </tr> </table>			Use of the module for other course programs	none																		
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16	Responsible Lecturer: Dr. Katrin Bergener, Dr. Armin Stein	Department: Münster School of Business and Economics																					
17	Misc.:																						

Programming

Module Title english:		Programming			
Course Program:		Bachelor Information Systems			
1	Module No: Inf 1	State: Compulsory	Language of Instruction: German		
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 Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
Course content:					
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: Examinations for every part of the module																	
8	Relevant Work: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">No</th> <th style="width: 50%;">Number and Type; Connection to Course</th> <th style="width: 20%;">Duration</th> <th style="width: 25%;">Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Written exam</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Written exam	120 min.	100 %						
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Total		9 CP																
12	Weight of the module grade for the overall grade: 9/180 (5%)																	
13	Module Prerequisites: none																	

14	Presence: Presence is strongly recommended to warrant learning success	
15	Mobility/Acknowledgement: <hr/> Use of the module for other course programs none	
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: QM 1	State: Compulsory	Language of Instruction: German		
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/ Exercise	Mathematics for Economists (lecture and tutorial)	Compulsory	75 h (5 CH) 105
2	Exercise	Mathematics Adjustment course	Compulsory	30 h (2 CH) 60	
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
	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	<p>Learning outcomes:</p> <p>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</p> <p>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)</p>											
6	Description of possible electives within the modules: none											
7	Examination: Final Module Exam											
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Electronic exam (LPLUS)</td> <td>90 min.</td> <td>100 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Electronic exam (LPLUS)	90 min.	100 %
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10	Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.											
11	<p>CP Assignment:</p> <table border="1"> <tbody> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>2.50 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>3.50 CP</td> </tr> </tbody> </table>				Presence	No 1	2.50 CP	No 2	1.00 CP	Relevant Work	No 1	3.50 CP
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	Study Work	No 1	2.00 CP
	Total		9 CP
12	Weight of the module grade for the overall grade: 9/180 (5%)		
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	
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.		

Foundations of Business Administration

Module Title english:		Foundations of Business Administration				
Course Program:		Bachelor Information Systems				
1	Module No: BWL 1	State: Compulsory	Language of Instruction: German			
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	Introduction to Business Administration	Compulsory	30 h (2 CH)	30
	2	Lecture	Finance	Compulsory	30 h (2 CH)	45
3	Lecture	Investment	Compulsory	30 h (2 CH)	45	
4	Exercise	Tutorial	Compulsory	30 h (2 CH)	30	
4	Module Profile:					
	<p>Purpose of the module/integration into curriculum: The course serves as a natural starting point for every student of economic sciences by identifying and analysing the structure of modern enterprises. Therefore, transmission of basic knowledge and methods for analytic decision-making are the course's main objectives. In the following semesters, students will mainly analyze isolated parts of economic enterprises. Therefore, it is vital to provide a broader perspective on economic theory. Knowledge gained in the fields of investment and finance is meant to support everyday decision-making.</p> <p>Course content: The module provides students with an overview of essential economic questions and methods and introduces the diverse functional units a firm is composed of. A profound analysis of investment and finance decisions – including the utilization of associated mathematical tools – serves as a basis for further observations: students are expected to reason by using elementary economic concepts, autonomously develop solution approaches, classify tasks into a broader context and solve these especially in the area of investment and finance. The course is divided into three different parts that pursue the following learning objectives:</p>					
5	Learning outcomes:					
	<p>Academic: The students are able to argue using basic business concepts, develop their own solutions, classify tasks into a broader context and solve them independently. In this context, they get basic ethical skills used in the economic sense. In addition, they are able to classify and evaluate financing options in business context. Investment projects can be assessed in terms of their advantageousness depending on their type of financing. In addition to the knowledge of the necessary concepts, students can apply them independently for qualitative as well as quantitative analysis. The knowledge gained from the more in-depth discussed area "Investment and Corporate Finance" can be used in practical decision-making.</p>					

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
	1	Final written exam	120 min.
			Part of final mark in % 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
		No 3	1.00 CP
		No 4	1.00 CP
	Relevant Work	No 1	5.00 CP
Total		9 CP	
12	Weight of the module grade for the overall grade: 9/180 (5%)		
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 Mathematics, Bachelor Physics, Master Business Chemistry	
16	Responsible Lecturer: Prof. Dr. Andreas Pfingsten		Department: Münster School of Business and Economics
	17 Misc.:		

Data Management

Module Title english:		Data Management			
Course Program:		Bachelor Information Systems			
1	Module No: WI 2	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	Data Management	Compulsory	30 h (2 CH) 60
	2	Exercise	Tutorial Data Management	Compulsory	30 h (2 CH) 60
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: 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.</p> <p>Course content: 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.</p>				
Themes			Learning objectives		

	<table border="1"> <tr> <td>Conceptual design</td> <td>To model business requirements regarding the data of information systems using entity relationship models.</td> </tr> <tr> <td>Data-processing design</td> <td>To transform the conceptual design into relational data models; to apply normal forms of database design.</td> </tr> <tr> <td>Implementation</td> <td>To implement the conceptual and the data-processing design using a relational database; to use the Structured Query Language for addressing business requirements</td> </tr> <tr> <td>Transactional aspects and locking mechanisms</td> <td>To use common functionalities of relational database management systems (RDBMS), especially transactional aspects and locking mechanisms</td> </tr> </table>	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			
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Transactional aspects and locking mechanisms	To use common functionalities of relational database management systems (RDBMS), especially transactional aspects and locking mechanisms											
5	<p>Learning outcomes:</p> <p>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.</p> <p>Soft skills: The students learn and deepen problem solving in small groups as well as presentation techniques regarding their exercise results.</p>											
6	<p>Description of possible electives within the modules: none</p>											
7	<p>Examination: Final Module Exam</p>											
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Written Exam</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>	No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final Written Exam	120 min.	100 %			
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9	<p>Study Work: none</p>											
10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>											
11	<p>CP Assignment:</p> <table border="1"> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>4.00 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>6 CP</td> </tr> </table>	Presence	No 1	1.00 CP	No 2	1.00 CP	Relevant Work	No 1	4.00 CP	Total		6 CP
Presence	No 1		1.00 CP									
	No 2	1.00 CP										
Relevant Work	No 1	4.00 CP										
Total		6 CP										
12	<p>Weight of the module grade for the overall grade: 6/180 (3,33%)</p>											

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: <hr/> <table border="1" data-bbox="217 501 1436 555"> <tr> <td data-bbox="217 501 826 555"> Use of the module for other course programs </td> <td data-bbox="826 501 1436 555"> none </td> </tr> </table>		Use of the module for other course programs	none
Use of the module for other course programs	none			
16	Responsible Lecturer: Prof. Dr. Dr. h.c. 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: Inf 2	State: Compulsory	Language of Instruction: German		
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 Profile:				
	<p>Purpose of the module/integration into curriculum: The knowledge acquired in this lecture is a prerequisite for the modules “Software Engineering,” “Computer Structures and Operating Systems”, “Computer Science in depth”, “Project Seminar”, and the Bachelor thesis. The module presupposes basic programming and mathematical skills as conveyed in the modules “Programming” and “Mathematics for Economists”.</p> <p>Course content: 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.</p>				
	Themes	Learning objectives			
	Representative selection of data structures	<ul style="list-style-type: none"> • Explain layout of and differences between discussed data structures. • Construct and apply suitable data structures for given scenarios. 			

		<ul style="list-style-type: none"> Evaluate different data structures for given scenarios (e.g., in view of memory requirements and running time of relevant algorithms). 															
	Fundamental algorithms	<ul style="list-style-type: none"> Apply and program algorithms. Develop new algorithms. 															
	Analysis and evaluation of algorithms	<ul style="list-style-type: none"> Explain the notion of efficiency. Analyze and evaluate algorithms (e.g., in terms of their complexity). 															
5	<p>Learning outcomes:</p> <p>Academic: Evaluation, selection, and application of suitable data structures and algorithms for given scenarios.</p> <p>Soft skills: Independent and team work to discuss and solve algorithmic problems. Presentation of devised solutions in small groups.</p>																
6	<p>Description of possible electives within the modules: none</p>																
7	<p>Examination: Examinations for every part of the module</p>																
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Written exam</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>			No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Written exam	120 min.	100 %						
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10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>																
11	<p>CP Assignment:</p> <table border="1"> <tbody> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>2.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>4.50 CP</td> </tr> <tr> <td>Study Work</td> <td>No 1</td> <td>1.50 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>9 CP</td> </tr> </tbody> </table>			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
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	<p>Weight of the module grade for the overall grade: 9/180 (5%)</p>																

13	Module Prerequisites: none			
14	Presence: Presence is strongly recommended to warrant learning success			
15	Mobility/Acknowledgement: <hr/> <table border="1" data-bbox="217 465 1436 521"> <tr> <td data-bbox="217 465 831 521"> Use of the module for other course programs </td> <td data-bbox="831 465 1436 521"> none </td> </tr> </table>		Use of the module for other course programs	none
Use of the module for other course programs	none			
16	Responsible Lecturer: Prof. Dr. Gottfried Vossen	Department: School of Business and Economics		
17	Misc.:			

Operations Research

Module Title english:		Operations Research			
Course Program:		Bachelor Information Systems			
1	Module No: QM 2	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	Operations Research	Compulsory	30 h (2 CH) 60
2	Exercise	Tutorial Operations Research	Compulsory	30 h (2 CH) 60	
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	The course OR brings to the students mathematical optimization tools being very helpful in business administration. Hence OR can be applied in nearly every module that has at least a partially quantitative perspective. Prerequisite is a thorough knowledge of topics covered in the moduls "Mathematics for IS".				
	Course content:				
	Themes	Learning objectives			
	Introduction to Optimization	Defining an classifying optimization problems. Students are able to transform real problems to abstract models. Further, they can distinguish between easy and hard problems based on runtime complexity with respect to standardized machine models.			
Graphs and Trees	Students are able to transfer problems from practice an theory to graph-based models and can transfer graph problems to new areas of application.				
Linear Programming	Students are able to describe and solve problems using linear models. They have detailed insight into linear programming and the mathematical beackground. They are able to deduce basic approaches like the simplex algorithm snd know of specific (integer) formulations and solution strategies.				
Nonlinear Optimization	Students can identify, model and solve nonlinear problems. Besides deterministic methods, they are able to apply randomized heuristics.				
Decision Theory	Students are able to describe and distinguish decision problems. They are able to critically apply basic decision mechanisms. Additionally, they have knowledge of basic principles in game theory.				

5	<p>Learning outcomes: Academic: The students are able to transpose problems of business administration into mathematical models of Operations Research. They solve those problems and identify optimal decisions. Doing this, they have insight into extensions as well as limitations of the applied algorithms. 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)</p>																
6	<p>Description of possible electives within the modules: none</p>																
7	<p>Examination: Examinations for every part of the module</p>																
8	<p>Relevant Work:</p> <table border="1" data-bbox="217 741 1436 857"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Written exam</td> <td>90 min.</td> <td>100 %</td> </tr> </tbody> </table>			No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Written exam	90 min.	100 %						
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10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>																
11	<p>CP Assignment:</p> <table border="1" data-bbox="217 1285 1436 1574"> <tbody> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>3.00 CP</td> </tr> <tr> <td>Study Work</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>6 CP</td> </tr> </tbody> </table>			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
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	<p>Weight of the module grade for the overall grade: 6/180 (3,33%)</p>																
13	<p>Module Prerequisites: none</p>																
14	<p>Presence: Presence is strongly recommended to warrant learning success</p>																
15	<p>Mobility/Acknowledgement:</p> <table border="1" data-bbox="217 1995 1436 2051"> <tr> <td>Use of the module for other course programs</td> <td>none</td> </tr> </table>			Use of the module for other course programs	none												
Use of the module for other course programs	none																

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: BWL 2	State: Compulsory	Language of Instruction: German		
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	Accounting and Annual Financial Statements	Compulsory	30 h (2 CH) 60
	2	Lecture	Foundations of Accounting	Compulsory	45 h (3 CH) 75
3	Exercise	Tutorial on Foundations of Corporate Accounting	Compulsory	30 h (2 CH) 30	
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: Accounting and Annual Financial Statement: As businesses constantly execute financial transactions including sales, purchase, payments etc. students will learn to book those transactions in the course of the account systems. The accumulation of all transactions is recorded in the annual financial statements. Those provide an overview of the financial condition of an enterprise. All information regarding the business is presented in a structured manner. To filter the required internal and external accounting information from the report, managers and investors must be capable of reading and interpreting financial statements. Students will therefore learn to read annual financial statements and understand them in detail. The first part of the course comprises the fundamentals of financial accounting as part of the organisational bookkeeping and annual reporting. The course will continue with the system of accounting transactions and annual statements. Within the scope of double-entry bookkeeping students will learn to execute accounting transactions on their own. In the fourth part students will organise transactions in standard forms of accounting on their own. The course closes with a comprehensive view as a basis for closing accounts. Foundations of Accounting: Managers and investors require internal and external accounting information for business and investment decisions. This course will enable students to learn about the roles, procedures and shortcomings of the mathematical models in use. In the first half of the semester students gain knowledge on costing systems and cost information for managers' decision-making and control. Thus, students learn on how to gain quantitative information, which is in other classes frequently taken for granted. During the second half of the semester, students gain knowledge about financial accounting principles within Germany which forms the basis for other courses focusing on special accounting issues. Furthermore, it enables students to assess differences between German GAAP and international accounting principles in advanced courses.</p> <p>Course content:</p>				

Accounting and Annual Financial Statement: The aim of this course is that students will gain the ability to understand accounting and financial accounting statements. By the end of the course students will be capable of independently booking transactions in the course of the accounting system. Beyond that they will be able to read and interpret annual financial statements.

Foundations of Accounting: The aim of this course is that students will be able to understand the principles of both management and financial accounting systems. By the end of the course, it is expected that the students understand and are able to apply management accounting systems in different settings. In addition, students will gain an understanding in developing and analysing annual financial statements under German GAAP.

Themes	Learning objectives
Financial accounting as an element of organisational bookkeeping	To learn about the systematisation of organisational bookkeeping
Fundamentals of financial accounting	To study the organisation, legal bases and components of financial accounting
System of accounting and financial statements	To evaluate the financial and profit situation of a business as well as the system of doubleentry-bookkeeping and financial statements
Booking of complex business transactions	To book capital assets, personnel expenditures, inventory, fuel, raw and auxiliary materials as well as legal titles To learn about the structure of standard forms of accounts and standard forms of accounts in industry enterprises
Standard forms of accounts to organise the booking system	To execute a closing account
Purpose of accounting systems	To learn about the objectives of accounting systems and differences between essential terms.
Management accounting systems	To comprehend the scope of internal accounting systems depending on allocated costs and time
Cost-type accounting	To read and have a basic understanding of cost types focusing on mathematical methods and calculatory costs.
Cost-centre accounting	To assess the appropriateness in allocating costs to different costcentres applying the cost distribution sheet.
Cost-object accounting	To learn about a variety of methods to conduct cost-object accounting. To explain techniques which provide information concerning the company's success.
Selected cost accounting systems	To use additional cost accounting systems with a special focus on providing information for decision making.
Basic principles in financial accounting	To appreciate the intention and legal fundamentals of the financial statement considering addressees and legal principles emerging from the literature.
Balance sheet	To evaluate the elements of the balance sheet including both fixed and current assets and equity and debt.

	Profit and loss statement	To study the types of profit and loss statements in use. To gain knowledge about the disposition of the net income.														
	Financial statement analysis	To perform financial statement analysis in order to assess the financial situation (profitability and financial risk) of a company applying the understanding gained before														
5	<p>Learning outcomes:</p> <p>Academic:</p> <p>Accounting and Annual Financial Statement: During the 90 minutes written examination students have to accomplish various bookings in standard forms of accounts. Finally all of those are merged in the closing account. In the written examination, students are supposed to demonstrate their abilities</p> <ul style="list-style-type: none"> • Understand the fundamentals of financial accounting • Book specific transactions in standard forms of accounts • Read and interpret annual financial statements • Select and identify relevant information from the statement <p>Foundations of Corporate Accounting: The aim of this course is that students will be able to understand the principles of both management and financial accounting systems. By the end of the course, it is expected that the students understand and are able to apply management accounting systems in different settings. In addition, students will gain an understanding in developing and analysing annual financial statements under German GAAP. In the written examination, students are supposed to demonstrate their abilities</p> <ul style="list-style-type: none"> • to solve problems effectively within a limited period of time, • to transfer and integrate knowledge, methods and theory from lectures and workshops, • to present their solutions in a coherent and sophisticated manner, • to select and identify the most relevant aspects first. 															
6	Description of possible electives within the modules: none															
7	Examination: Examinations for every part of the module															
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Written exam on Accounting and Annual Statements (No. 1)</td> <td>90 min.</td> <td>33.33 %</td> </tr> <tr> <td>2</td> <td>Written exam on Foundations of Accounting (No. 2)</td> <td>120 min.</td> <td>67.67 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Written exam on Accounting and Annual Statements (No. 1)	90 min.	33.33 %	2	Written exam on Foundations of Accounting (No. 2)	120 min.	67.67 %
No	Number and Type; Connection to Course	Duration	Part of final mark in %													
1	Written exam on Accounting and Annual Statements (No. 1)	90 min.	33.33 %													
2	Written exam on Foundations of Accounting (No. 2)	120 min.	67.67 %													
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	1.50 CP													

		No 3	1.00 CP
	Relevant Work	No 1	2.00 CP
		No 2	3.50 CP
	Total		9 CP
12	Weight of the module grade for the overall grade: 9/180 (5%)		
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 Mathematics, Bachelor Physics, Master Business Chemistry	
16	Responsible Lecturer: Professor Dr. Peter Kajüter		Department: School of Business and Economics
17	Misc.:		

Process Management

Module Title english:		Process Management			
Course Program:		Bachelor Information Systems			
1	Module No: WI 3	State: Compulsory	Language of Instruction: German		
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	Process Management and Application Systems	Compulsory	30 h (2 CH) 60
	2	Exercise	Tutorials on Process Management and Application Systems	Compulsory	30 h (2 CH) 60
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: Enterprises and public administrations make use of different classes of application systems to help people with their work tasks. The module process management builds on the basic skills learned in the modules Data Management, Software Engineering and Business Administration. With respect to methods, the data view is enhanced by the organizational, functional and process view. Especially, essential methods for modelling, analysis and design of business processes are taught. With respect to content, depicting and carrying out various business tasks in different classes of application systems are shown, analysed and designed. Teaching methods include lectures, exercises, lab exercises using different ERP systems and short presentations by the students.</p> <p>Course content: An application system is a system of software components to manage certain tasks in a business environment. The lecture Process Management provides basic knowledge for the design and the use of application systems in enterprises and enterprise networks. Initially, foundations of information modeling (e.g., functional, organizational, and process view) are intensified. Structure and function of selected application systems (especially ERP systems) are treated in depth and practiced in different systems. Moreover, management tasks concerning the selection, introduction and usage of application systems are covered. In this, inter-company application scenarios and their peculiarities are discussed. Guest lectures from the practice round out the lecture program. In tutorials, the course content is repeated and applied in a problem-oriented way.</p>				
	Themes	Learning objectives			
	Basic features of application systems	Classifying application systems to describe and explain their potential for the enterprise.			

	From concept to application	Deepen knowledge of modeling techniques (functional, organizational, process modeling) and apply it to solve practical problems.										
	Fundamentals of ERP Systems	Understanding the structure and the functions of ERP systems, integrated business processes and management information systems.										
	Management and operations with application systems	Analyzing the potential of application systems from an organizational point of view as well as considering selected obstacles in enterprises.										
	Distributed application systems	Recognizing potential challenges and explain peculiarities of distributed application systems. Applying them to develop innovative network-based business models.										
5	<p>Learning outcomes:</p> <p>Academic: Upon completion of the course, students can describe basic properties and functions of different classes of business application systems (e.g., ERP, MMS, PLM, CRM, SRM, SCM) and their integration. Students deepen their understanding of different information modeling methods and implement them to purposefully solve real-world problems. They can describe different (standard) business processes in companies and their integration. Furthermore they can identify and use strategies and tools to analyze and present the business potential of enterprise systems. Students will identify organizational challenges and obstacles related to enterprise systems, as well as analyze and resolve them. They recognize the potential benefits and characteristics of distributed application systems and use them to develop innovative network-based business models.</p> <p>Soft skills: Students learn and deepen the problem-solving capabilities in small groups and strengthen their teamwork as well as communication and cooperation abilities. Moreover, presentation skills are strengthened during the presentation of their results. Through self-study the content of the course is deepened. Searching and analyzing academic literature is practiced by preparing for class.</p>											
6	Description of possible electives within the modules: none											
7	Examination: Final Module Exam											
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final written exam^</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final written exam^	120 min.	100 %
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:											
		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: 6/180 (3,33%)		
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	
16	Responsible Lecturer: Prof. Dr. Dr. h.c. Dr. h.c. Jörg Becker	Department: School of Business and Economics	
17	Misc.:		

Software Engineering

Module Title english:		Software Engineering			
Course Program:		Bachelor Information Systems			
1	Module No: Inf 3	State: Compulsory	Language of Instruction: German		
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 Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
	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: 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.	100 %
9	Study Work:			
	No	Number and Type; Connection to Course	Duration	
	1	Exercises	6 x approx. 5 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: 6/180 (3,33%)			
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		

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: QM 3	State: Compulsory	Language of Instruction: German		
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 Profile:				
	Purpose of the module/integration into curriculum:				
	In IT supported business, huge amount of data emerges which is to be exploited in order to improve processes etc. The module first discusses “data” and, subsequently, deals with some 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.				
	Course content:				
	Themes	Learning objectives			
	Descriptive Statistics: Data, Scales	To get acquainted with data sources, the statistical meaning of numbers and data representations.			
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	<p>Learning outcomes:</p> <p>Academic: The student should demonstrate the capability to handle moderate probability models describing economical problems. Furthermore, the the student should understand the interrelation between theoretical models and empirical data – e.g., by means of limit theorems.</p> <p>Soft skills: Reading and understanding formal texts using probability-language. Working in small groups (self study) in order to solve mathematical problems.</p>											
6	<p>Description of possible electives within the modules: none</p>											
7	<p>Examination: Final Module Exam</p>											
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final written exam</td> <td>90 min.</td> <td>100 %</td> </tr> </tbody> </table>	No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final written exam	90 min.	100 %			
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9	<p>Study Work: none</p>											
10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>											
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Relevant Work	No 1	4.00 CP										
Total		6 CP										
12	<p>Weight of the module grade for the overall grade: 6/180 (3,33%)</p>											
13	<p>Module Prerequisites: none</p>											
14	<p>Presence: Presence is strongly recommended to warrant learning success</p>											
15	<p>Mobility/Acknowledgement:</p> <table border="1"> <tbody> <tr> <td>Use of the module for other course programs</td> <td>none</td> </tr> </tbody> </table>	Use of the module for other course programs	none									
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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: BWL 4	State: Compulsory	Language of Instruction: German		
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 Profile:				
	<p>Purpose of the module/integration into curriculum: This module gives an introduction into the field of operations management. Selected business cases motivate the themes by demonstrating the potential that can be realized with good operations management. Furthermore, the basic methods of operations management and their practical application are taught. The exercise supports the practice and deepening of the lecture content by applying it to concrete problems. Operations management deals with the management of processes in the production and service sector, and is located in the functional unit operations. For managing the assigned processes it is necessary to continually coordinate with other functional areas. For instance, it is important for inventory management to know the upcoming sales promotions planned by marketing. Regarding other courses, students should have successfully passed the first and the second semester, especially the lectures “Mathematics for Economists” and “Statistics I”. Furthermore, this module is a foundation for the module “Logistics Management”.</p> <p>Course content: The core objective of this module is to teach the most important qualitative and quantitative methods under the below themes.</p>				
	Themes	Learning objectives			
	Forecasting and Demand Planning	To Describe and compare various types of quantitative and qualitative models. To Determine which forecasting model produces the best forecast for given data. Controlling charts to monitor a forecast.			
	Location Planning	To Learn different approaches for location decisions.			
	Process Design	To design, model and improve processes by using different approaches.			
	Quality Management	To understand the importance of quality management and get to know different approaches for it. To be able to apply control charts in the context			

		of quality management and to check whether a process fulfills desired tolerance limits.													
	Inventory Management	To learn different functions of inventories, objectives of inventory control, and techniques for determining how much to order and when to order.													
	Production Planning	To learn the different approaches for production planning like manufacturing resources planning, aggregate planning, master production schedule, materials requirements planning and concepts and criterions for just in time production.													
	Scheduling Operations	To comprehend the objectives and methods of scheduling operations e.g. to allocate workloads to specific work centers and to determine the sequence in which operations have to be performed.													
5	<p>Learning outcomes:</p> <p>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.</p> <p>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. Also, students learn how to use software tools that support mathematical calculations.</p>														
6	Description of possible electives within the modules: none														
7	Examination: Final Module Exam														
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Relevant Work	No 1	4.00 CP													
Total		6 CP													

12	Weight of the module grade for the overall grade: 6/180 (3,33%)	
13	Module Prerequisites: Students should have successfully passed the first and the second semester, especially the lectures “Mathematics for Economists”.	
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
16	Responsible Lecturer: Prof. Dr.-Ing. Bernd Hellingrath	Department: 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: So 1	State: Compulsory	Language of Instruction: German		
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	Economics for IS: lecture	Compulsory	30 h (2 CH) 60
2	Exercise	Economics for IS: tutorial	Compulsory	30 h (2 CH) 60	
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
The course explains basic concepts of economics, including micro economics, macro economics, economic policy, and both their methodological 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: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">No</th> <th style="width: 50%;">Number and Type; Connection to Course</th> <th style="width: 20%;">Duration</th> <th style="width: 25%;">Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Written Exam</td> <td>90 min.</td> <td>100 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final Written Exam	90 min.	100 %			
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Use of the module for other course programs	none														
16	Responsible Lecturer: Professor Dr. Ulrich van Suntum		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.
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Project Management

Module Title english:		Project Management			
Course Program:		Bachelor Information Systems			
1	Module No: WI 4	State: Compulsory	Language of Instruction: 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/ Exercise	Project Management	Compulsory	60 h (4 CH) 120
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	Fundamental knowledge of project management is an essential part of conducting (IT) projects. The content, methods and software tools learned in this course are essential for further courses in the Information Systems study program, especially for the project seminar. Moreover, general knowledge of managing projects might be helpful for students during the planning and work on their Bachelor and Master theses. The teaching methods applied in this course 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.				
	Course content:				
	The Project Management course is focused on the dissemination of fundamental knowledge of management of (IT) projects. The course 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. Furthermore, main project management processes are studied within the course. Project management methods and tools are introduced in the lectures and are afterwards applied for solving problems and completing tasks within software tutorials and student assignments. Finally, the course includes guest lectures, held by industry representatives, where the connection of the lecture content to the projects in practice is established.				
	Themes	Learning objectives			
	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 SAP Project System).								
5	<p>Learning outcomes:</p> <p>Academic: 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.</p> <p>Soft skills: Through assignments, students apply and improve their capabilities in group work, problem-solving, academic writing, presentation and discussion. They also have an opportunity to improve their English language skills, as both oral and written assignments need to be submitted in English. They gain experience in working with project management software (such as Microsoft Project and SAP Project System). The course contents need to be further explored by the students through self-study, thus improving their capabilities to work independently. Finally, within the workshop on self-management, the students are introduced to the techniques for time management and task management, which they can then discuss and apply in their future studies and work.</p>									
6	Description of possible electives within the modules: none									
7	Examination: Examinations for every part of the module									
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final written exam</td> <td>120 min.</td> <td>80 %</td> </tr> </tbody> </table>		No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final written exam	120 min.	80 %
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1	Final written exam	120 min.	80 %							

	2	Group work essay (group of approx. 5 students)	4000 words	10 %
	3	Short group presentation (group of approx. 5 students)	20 min.	10 %
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	3.00 CP	
		No 2	0.50 CP	
		No 3	0.50 CP	
Total		6 CP		
12	Weight of the module grade for the overall grade: 6/180 (3,33%)			
13	Module Prerequisites: There are no prerequisites, however, having completed the module Application Systems would be beneficial in order to understand the inner workings of project management software (such as SAP PS).			
14	Presence: Presence is strongly recommended to warrant learning success			
15	Mobility/Acknowledgement:			
	Use of the module for other course programs	none		
16	Responsible Lecturer: Dr. Michael Räckers		Department: School of Business and Economics	
17	Misc.:			

Communication and Collaboration Systems

Module Title english:		Communication and Collaboration Systems			
Course Program:		Bachelor Information Systems			
1	Module No: WI 5	State: Compulsory	Language of Instruction: 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	Communication and Collaboration Systems	Compulsory	30 h (2 CH) 75
	2	Exercise	Application of Communication and Collaboration Systems	Compulsory	30 h (2 CH) 45
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: The increasing ubiquity of collaborative, social networking, and mobile computing technologies is playing a key role in transforming work practices. Such technological affordances have influenced the communicative and collaborative practices that offer new opportunities but also challenges to contemporary organisational and inter-organisational systems. Yet our understanding of these changes and the implications for management remain poorly developed. Hence, this course attempts to offer rich theoretical and practical insights into the various dimensions of the relationship between communication and collaboration processes and technological advances in various organisational and inter-organisational contexts. In so doing, it will draw on bodies of social and organisation theory to develop in-depth understanding of communication and collaboration practices that are at the heart of organisational and societal transformations in the Digital Age.</p> <p>Course content: Particular emphasis will be placed on the role of technologies in processes of communication, knowledge creation/sharing, and learning; processes of organizational and societal transformations and the related challenges; ICT and new modes of organising and teamwork; and, the emergence of new, distributed modes of organising work and collaborative production. Importantly, a key rationale of this course is to provide students with a mature and actionable understanding of this emerging landscape, with a view to shaping various collaborative arrangements and handling the related communication challenges.</p>				
	Themes		Learning objectives		
	Knowledge and its organisation/ management, computer supported collaborative work, ICT and new modes of organising and communicating/		Developing in-depth conceptual and practical understanding of the relationship between communicative and collaborative practices and novel technological advances; and various		

	collaborating, virtual teamwork and relational arrangements.	related organisational and managerial implications.																				
5	<p>Learning outcomes:</p> <p>Academic: Understand key concepts related to the role of technology, knowledge and organisations and their inter-relationships. Demonstrate a sophisticated appreciation of the complexity of processes of IT-enabled processes of communication and collaboration and the challenges associated with managing them. Draw on wider social debates (e.g. concerning meaning, power and knowledge) to illuminate issues related to communication and collaboration in contemporary organisational and inter-organisational systems.</p> <p>Soft skills: Demonstrate the practical applicability of a range of theoretical perspectives to understanding the relationship between IT and collaboration and communication processes. Develop communication and critical thinking skills.</p>																					
6	Description of possible electives within the modules: none																					
7	Examination: Examinations for every part of the module																					
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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.																					
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12	Weight of the module grade for the overall grade: 6/180 (3,33%)			
13	Module Prerequisites: none			
14	Presence: Presence is strongly recommended to warrant learning success			
15	Mobility/Acknowledgement: <hr/> <table border="1" data-bbox="215 566 1436 633"> <tr> <td data-bbox="215 566 821 633">Use of the module for other course programs</td> <td data-bbox="821 566 1436 633">none</td> </tr> </table>		Use of the module for other course programs	none
Use of the module for other course programs	none			
16	Responsible Lecturer: Prof. Dr. Stefan Klein, Dr. Simeon Vidolov	Department: School of Business and Economics		
17	Misc.: The lecturer announces during the first lecture the registration process for the participation in the exercises			

Computer Structures and Operating Systems

Module Title english:		Computer Structures and Operating Systems			
Course Program:		Bachelor Information Systems			
1	Module No: Inf 4	State: Compulsory	Language of Instruction: English		
2	Turn: each summer semester	Duration: 1 semester	Semester: 4	CP: 9	Workload (h): 270
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH) Self-Study (h)
	1	Lecture	Computer Structures and Operating Systems	Compulsory	60 h (4 CH) 120
	2	Exercise	Tutorial on Computer Structures and Operating Systems	Compulsory	30 h (2 CH) 60
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: This course presents the foundations of computer architecture and organization as well as the fundamentals of operating systems. It covers the basic composition and functionality of a computer, starts from individual components and derives larger units from them. An important aspect is the understanding of mathematical foundations underlying computer circuits, which is why the course takes students from Boolean functions to adders, multiplexers, PLAs, and storage. The result is the basic von Neumann model of a sequential machine, which is treated 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 which interacts with specific hardware and provides abstract services for applications that do not need to know details about specific hardware. Typical functionality and services include resource and memory management, process management and processor scheduling, I/O, as well as protection and security mechanisms, all of which are addressed in class. Thus, this course forms the basis for understanding hardware and software interactions in larger systems.</p> <p>Course content: The primary purpose of the course is to develop a solid background of computer structures and operating systems. Students learn to translate problems into Boolean functions, to design and optimize functional units for sample problems, to discuss the fundamental von Neumann concept, in particular with respect to performance. They are able to discuss architectures, concepts, and components of operating systems and to apply typical management tasks and data structures in sample scenarios.</p>				
	Themes	Learning objectives			
	Von Neumann computer concept, programming models for CPUs, pipelining	To describe and make good use of the most fundamental computer model that is still valid today, seen from a modern perspective of achieving performance			

	Assembler programming	To explain and write simple procedures in this field of programming as used in high-performance as well as embedded applications		
	Boolean functions, multiplexers, adders, PLAs, PALs	To apply the basics of switching theory and discuss its connections to modern computer building blocks		
	Operating system architecture, processes, threads	To discuss major architectures and components of modern OSs; to explain and contrast processes and threads and their roles for OSs and applications		
	Scheduling, I/O, virtual memory, file systems	To explain OS data structures, algorithms, and management techniques		
	Concurrency, mutual exclusion	To analyze programming challenges arising from concurrency and to apply appropriate techniques addressing these challenges		
	Security	To discuss the notion of IT security and to apply security mechanisms provided by the operating system in support of secure IT systems		
5	Learning outcomes: Academic: Solid understanding of computer organization and the interaction of hardware and operating software. Soft skills: Independent and interactive work with a simulation tool, individually as well as in groups.			
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	10 Course Assignments	10 x approx. 5 pages each	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	2.00 CP	
		No 2	1.00 CP	
		No 1	4.00 CP	

	Relevant Work	No 2	2.00 CP
	Total		9 CP
12	Weight of the module grade for the overall grade: 9/180 (5%)		
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	
16	Responsible Lecturer: Prof. Dr. Gottfried Vossen	Department: School of Business and Economics	
17	Misc.:		

Data Analysis and Simulation

Module Title english:		Data Analysis and Simulation			
Course Program:		Bachelor Information Systems			
1	Module No: QM 4	State: Compulsory	Language of Instruction: German		
2	Turn: each summer semester	Duration: 1 semester	Semester: 4	CP: 9	Workload (h): 270
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
3	Lecture/ Exercise	Simulation	Compulsory	30 h (2 CH) 60	
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	This module is based on the introductory module “Data and Probability”. It covers the fundamentals of statistical data analysis as well as the use of simulation methods in order to investigate business processes. To this end, software tools for statistical analysis and simulation are investigated during the courses. The techniques covered are basic in forthcoming modules focusing on empirical data. In particular, specialization courses in Quantitative Methods often employ tools and methods for statistical testing or simulation.				
	Course content:				
		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.			
	Sampling distributions	To learn how the distribution of condensed data (test statistics) can be computed from the parent distribution – at least in some simple cases. To find approximate solutions provided by the central limit theorem.			
	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.			
	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. To know about problems that can be solved by simulation. To find out how methods of mathematics and simulation can complement each other in (interconnected) service systems. To generate germanely distributed random numbers for various applications by computer.													
	Simulation tools	To use software tools (such as “Arena”) to model interconnected service systems and execute simulations.													
5	<p>Learning outcomes:</p> <p>Academic: The Students know/can apply fundamental statistical methods in IS. He/she is capable of modeling queuing systems in mathematical terms.</p> <p>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 and Simulation</p>														
6	Description of possible electives within the modules: none														
7	Examination: Final Module Exam														
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Written Exam (Data Analysis and Simulation)</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>		No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final Written Exam (Data Analysis and Simulation)	120 min.	100 %					
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11	<p>CP Assignment:</p> <table border="1"> <tbody> <tr> <td rowspan="3">Presence</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>No 3</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>6.00 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>9 CP</td> </tr> </tbody> </table>		Presence	No 1	1.00 CP	No 2	1.00 CP	No 3	1.00 CP	Relevant Work	No 1	6.00 CP	Total		9 CP
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	No 2	1.00 CP													
	No 3	1.00 CP													
Relevant Work	No 1	6.00 CP													
Total		9 CP													
12	Weight of the module grade for the overall grade: 9/180 (5%)														
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
16	Responsible Lecturer: Prof. Dr. Heike Trautmann	Department: 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 courses. 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 mandatory.	

Digital Business

Module Title english:		Digital Business			
Course Program:		Bachelor Information Systems			
1	Module No: WI 6	State: Compulsory	Language of Instruction: 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 Profile:				
	Course content:				
	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:				

	<p>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.</p> <p>Soft skills: The student should demonstrate the ability</p> <ul style="list-style-type: none"> • to productively work in groups and • to coordinate with peers. 																		
6	Description of possible electives within the modules: none																		
7	Examination: Final Module Exam																		
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Group assignments during the course: a) written assignment (25%), b) short presentation (briefing) and written summary (25%)</td> <td>a) approx. 5 pgs, b) approx. 15 min., 5 pgs</td> <td>50 %</td> </tr> <tr> <td>2</td> <td>Written exam</td> <td>60 min.</td> <td>50 %</td> </tr> </tbody> </table>			No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Group assignments during the course: a) written assignment (25%), b) short presentation (briefing) and written summary (25%)	a) approx. 5 pgs, b) approx. 15 min., 5 pgs	50 %	2	Written exam	60 min.	50 %				
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Relevant Work	No 1	2.00 CP																	
	No 2	1.50 CP																	
Study Work	No 1	0.50 CP																	
Total		6 CP																	
12	Weight of the module grade for the overall grade: 6/180 (3,33%)																		
13	Module Prerequisites: Working Knowledge of English																		

14	Presence: Presence is strongly recommended to warrant learning success			
15	Mobility/Acknowledgement: <hr/> <table border="1" data-bbox="215 358 1436 448"> <tr> <td data-bbox="215 358 790 448"> Use of the module for other course programs </td> <td data-bbox="790 358 1436 448"> none </td> </tr> </table>		Use of the module for other course programs	none
Use of the module for other course programs	none			
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.			

Foundations of Marketing

Module Title english:		Foundations of Marketing			
Course Program:		Bachelor Information Systems			
1	Module No: BWL 8	State: Compulsory	Language of Instruction: German		
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	Foundations of Marketing	Compulsory	30 h (2 CH) 60
	2	Exercise	Tutorial on Foundations of Marketing	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	<p>Learning outcomes:</p> <p>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.</p> <p>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).</p>											
6	<p>Description of possible electives within the modules: none</p>											
7	<p>Examination: Final Module Exam</p>											
8	<p>Relevant Work:</p> <table border="1" data-bbox="217 913 1436 1025"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final written exam</td> <td>90 min.</td> <td>100 %</td> </tr> </tbody> </table>	No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final written exam	90 min.	100 %			
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9	<p>Study Work: none</p>											
10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>											
11	<p>CP Assignment:</p> <table border="1" data-bbox="217 1346 1436 1574"> <tbody> <tr> <td rowspan="2">Presence</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>Relevant Work</td> <td>No 1</td> <td>4.00 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>6 CP</td> </tr> </tbody> </table>	Presence	No 1	1.00 CP	No 2	1.00 CP	Relevant Work	No 1	4.00 CP	Total		6 CP
Presence	No 1		1.00 CP									
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Relevant Work	No 1	4.00 CP										
Total		6 CP										
12	<p>Weight of the module grade for the overall grade: 6/180 (3,33%)</p>											
13	<p>Module Prerequisites: none</p>											
14	<p>Presence: Attendance is strongly recommended to warrant learning success</p>											
15	<p>Mobility/Acknowledgement:</p>											

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

IT-Law

Module Title english:		IT-Law			
Course Program:		Bachelor Information Systems			
1	Module No: So 2	State: Compulsory	Language of Instruction: German		
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/ Exercise	IT-Law	Compulsory	60 h (4 CH) 120
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
	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	<p>Learning outcomes:</p> <p>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.</p> <p>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.</p>												
6	Description of possible electives within the modules: none												
7	Examination: Final Module Exam												
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final written exam</td> <td>120 min.</td> <td>100 %</td> </tr> </tbody> </table>				No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Final written exam	120 min.	100 %	
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9	Study Work: none												
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Relevant Work	No 1	4.00 CP											
Total		6 CP											
12	Weight of the module grade for the overall grade: 6/180 (3,33%)												
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	
16	Responsible Lecturer: Prof. Dr. Ulrich Luckhaus	Department: 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		
2	Turn: each semester	Duration: 1 semester	Semester: 5 or 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 Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
	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.				
		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																		
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	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: 12/180 (6.67%)																		
13	Module Prerequisites: none																		
14	Presence: Presence is strongly recommended to warrant learning success																		
15	<table border="1"> <thead> <tr> <th colspan="2" data-bbox="217 1785 1436 1818">Mobility/Acknowledgement:</th> </tr> </thead> <tbody> <tr> <td data-bbox="217 1852 826 1908">Use of the module for other course programs</td> <td data-bbox="826 1852 1436 1908">none</td> </tr> </tbody> </table>			Mobility/Acknowledgement:		Use of the module for other course programs	none												
Mobility/Acknowledgement:																			
Use of the module for other course programs	none																		
16	Responsible Lecturer: Prof. Dr. Herbert Kuchen	Department: School of Business and Economics																	

17	<p>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.</p>
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Specialization Information Systems

Module Title english:		Specialization Information Systems			
Course Program:		Bachelor Information Systems			
1	Module No: VM WI	State: Elective	Language of Instruction: German		
2	Turn: each semester	Duration: 2 semesters	Semester: 5 or 6	CP: 9	Workload (h): 270
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH) Self-Study (h)
	1	Lecture	Lecture Information Systems	Compulsory	30 h (2 CH) 45
	2	Seminar	Seminar Information Systems	Compulsory	30 h (2 CH) 120
	3	Seminar	Presentation skills	Compulsory	15 h (1 CH) 30
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	This specialization deepens the student's knowledge from various other courses, especially those from the first two semesters.				
	Course content:				
The module allows students to deepen their knowledge from previous lecture. Therefore, they have to attend one specialization lecture as well as one seminar. Both courses can be held in an integrated manner. Next to these aspects students will learn to deal with scientific writing and scientific literature. The search and appraisal of relevant literature of a field is one cornerstone of this module. Moreover, the results of the students have to be presented. Thus, this module should also focus on the corresponding presentation skills.					
	Themes	Learning objectives			
	Lectures on E-Government, Service Science, Business Process Management, Business Process Modeling, IT Consulting.	Students will learn about and apply the concepts and methods of the area of the lecture.			
	Scientific Work	The students acquire the capacity to work with scientific texts and methods, and to critically discuss and reflect on them.			
	Presentation	The students acquire the capacity to reproduce content they created themselves, prepared for a specific audience.			
5	Learning outcomes:				
	Academic:				
	Students deepen their knowledge of selected areas (see above) and the courses of the first study				

	<p>year. Moreover, the knowledge has to be applied in the seminar thesis.</p> <p>Soft skills: Students will achieve soft skills in the areas of presentation, communication, and creation of scientific output.</p>																	
6	<p>Description of possible electives within the modules: none</p>																	
7	<p>Examination: Examinations for every part of the module</p>																	
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Creation, presentation, and defense of seminar thesis</td> <td>20 pages + 1h presentation</td> <td>66.7 %</td> </tr> <tr> <td>2</td> <td>Exam: Lecture information systems</td> <td>60 min.</td> <td>33.3 %</td> </tr> </tbody> </table>			No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Creation, presentation, and defense of seminar thesis	20 pages + 1h presentation	66.7 %	2	Exam: Lecture information systems	60 min.	33.3 %			
	No	Number and Type; Connection to Course	Duration	Part of final mark in %														
	1	Creation, presentation, and defense of seminar thesis	20 pages + 1h presentation	66.7 %														
2	Exam: Lecture information systems	60 min.	33.3 %															
9	<p>Study Work: none</p>																	
10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>																	
11	<p>CP Assignment:</p> <table border="1"> <tbody> <tr> <td rowspan="3">Presence</td> <td>No 1</td> <td>1.00 CP</td> </tr> <tr> <td>No 2</td> <td>1.00 CP</td> </tr> <tr> <td>No 3</td> <td>0.50 CP</td> </tr> <tr> <td rowspan="2">Relevant Work</td> <td>No 1</td> <td>4.50 CP</td> </tr> <tr> <td>No 2</td> <td>2.00 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>9 CP</td> </tr> </tbody> </table>			Presence	No 1	1.00 CP	No 2	1.00 CP	No 3	0.50 CP	Relevant Work	No 1	4.50 CP	No 2	2.00 CP	Total		9 CP
	Presence	No 1	1.00 CP															
		No 2	1.00 CP															
		No 3	0.50 CP															
	Relevant Work	No 1	4.50 CP															
		No 2	2.00 CP															
Total		9 CP																
12	<p>Weight of the module grade for the overall grade: 9/180 (5%)</p>																	
13	<p>Module Prerequisites: none</p>																	
14	<p>Presence: Attendance in the lecture is strongly recommended to warrant learning success.</p>																	
15	<p>Mobility/Acknowledgement:</p>																	
	<p>Use of the module for other course programs</p>	<p>none</p>																
16	<p>Responsible Lecturer: Prof. Dr. Dr. h.c. Dr. h.c. Jörg Becker</p>		<p>Department: School of Business and Economics</p>															

17	Misc.:
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Specialization Computer Science

Module Title english:		Specialization Computer Science			
Course Program:		Bachelor Information Systems			
1	Module No: VM Inf	State: Elective	Language of Instruction: German		
2	Turn: each semester	Duration: 1 semester	Semester: 5 or 6	CP: 9	Workload (h): 270
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH) Self-Study (h)
	1	Lecture	Special lecture "Computer Science" such as e.g. "Computer Networks", "Distributed Systems", "Mainframe Computing" or "IT Security"	Compulsory	30 h (2 CH) 45
	2	Seminar	Seminar on Computer Science	Compulsory	30 h (2 CH) 120
	3	Seminar	Presentation skills	Compulsory	15 h (1 CH) 30
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	The knowledge and skills in a selected area of computer science are deepened. The students can select from a set of offered subjects. It is assumed that the participants know the concepts taught in the mandatory modules on computer science and that they are able to apply then corresponding methods. It is possible to continue deepening the selected topic when writing the bachelor thesis.				
Course content:					
This module enables the students to deepen their knowledge in a selected area of computer science. Possible areas are e.g. "Computer Networks", "Distributed Systems", "Mainframe Computing" and "IT Security". In addition to the new material, the students learn in the seminar how to write a scientific paper on a specific topic based on a previous study of the relevant literature. Moreover, they learn how to present this topic orally in a well-structured and understandable way using state-of-the-art tools (such as e.g. Powerpoint). The required soft skills w.r.t. to presentation technique are conveyed in a private discussion with a tutor.					
Themes			Learning objectives		
(e.g.) Computer Networks, Distributed Systems, Mainframe Computing, IT Security			Knowing and being able to apply the concepts and methods of the selected subject.		
Writing scientific papers			Reading and understanding scientific literature. Summarize the read material in a well-structured, understandable, and precise way in a scientific paper.		

	Presentation	Present the content of the written paper in a well-structured, understandable and precise way using state-of-the-art presentation tools (such as e.g. Powerpoint)		
5	Learning outcomes: Academic: Knowing and being able to apply the concepts of the selected topic. Soft skills: Soft skills: (among others) media competence, time management, rhetoric, presentation skills			
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.	33.3 %
2	Scientific paper + presentation	20 pages + 1h	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	1.00 CP	
		No 2	1.00 CP	
		No 3	0.50 CP	
	Relevant Work	No 1	2.00 CP	
		No 2	4.50 CP	
Total	9 CP			
12	Weight of the module grade for the overall grade: 9/180 (5%)			
13	Module Prerequisites: none			
14	Presence: Attendance of the lecture is strongly recommended to warrant learning success.			
15	Mobility/Acknowledgement:			

	Use of the module for other course programs	none
16	Responsible Lecturer: Prof. Dr. Herbert Kuchen	Department: School of Business and Economics
17	Misc.: Misc.: The students can select between different offered topics. The available topics are presented at the end of the previous semester. After that, the available places are assigned to the interested students.	

Specialization Quantitative Methods

Module Title english:		Specialization Quantitative Methods			
Course Program:		Bachelor Information Systems			
1	Module No: VM QM	State: Elective	Language of Instruction: German		
2	Turn: irregularly	Duration: 2 semesters	Semester: 5 or 6	CP: 9	Workload (h): 270
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH) Self-Study (h)
	1	Lecture	Advances in Quantitative Methods	Compulsory	30 h (2 CH) 55
	2	Seminar	Seminar in Quantitative Methods	Compulsory	30 h (2 CH) 120
	3	Seminar	Presentation skills	Compulsory	15 h (1 CH) 20
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: The modul deepens insight into a limited topic of QM. The covered topics may vary; frequently, they are subject to actual scientific research and discussion in QM. The lecture is held as a block course; according to the specific topic of the module, it tightens and deepens the mathematical prerequisites that are necessary from modules QM1 to QM4. In the seminar following the lecture, the students learn how to work on an scientific topic of QM starting from the technical literature. Based on the work on this literature, they prepare and give a talk. Soft skills like preparing slides and rhetorical techniques are discussed with the tutor in advance and also following the talk. Moreover, the module serves as a perspective to possible themes of the bachelor thesis.</p> <p>Course content: The topics vary according to actual scientific questions in QM. Hence, the learning objectives depending on those topics may differ. Anyway, the students should learn to investigate technical literature in QM and understand the application of the specific mathematical models and techniques in economical sciences.</p>				
5	Learning outcomes:				
	<p>Academic: Knowing and being able to apply the concepts of the selected topic.</p> <p>Soft skills: (among others) media competence, time management, rhetoric, presentation skills</p>				
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.	33.3 %
	2	Scientific paper + presentation	20 pages + 1h	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		1.00 CP
		No 2		1.00 CP
		No 3		0.50 CP
	Relevant Work	No 1		2.00 CP
		No 2		4.50 CP
Total			9 CP	
12	Weight of the module grade for the overall grade: 9/180 (5%)			
13	Module Prerequisites: none			
14	Presence: Attendance of the lecture is strongly recommended to warrant learning success.			
15	Mobility/Acknowledgement:			
	Use of the module for other course programs	none		
16	Responsible Lecturer: Prof. Dr. Heike Trautmann		Department: School of Business and Economics	
	Misc.: The students can select between different offered topics. The available topics are presented at the end of the previous semester. After that, the available places are assigned to the interested students.			

Specialization Business Administration

Module Title english:		Specialization Business Administration			
Course Program:		Bachelor Information Systems			
1	Module No: VM BWL	State: Elective	Language of Instruction: German or English		
2	Turn: each semester	Duration: 1 semester	Semester: 5 or 6	CP: 9	Workload (h): 270
3	Module Structure:				
	No	Type	Course	State	Workload (h)
					Presence (h + CH)
					Self-Study (h)
	1	Lecture	BWL 11 "Advanced Accounting", BWL 14 "Insurance Economics", BWL 15 "Advanced Marketing", BWL 32 "Business Ethics"	Elective	60 h (4 CH)
2	Lecture/ Exercise	BWL 9 "Quantitative Marketing", BWL 10 "Management & Governance"	Elective	90 h (6 CH)	90
3	Lecture/ Exercise	BWL 3 "Controlling", BWL 7 "Corporate Finance", BWL 12 "Advanced Taxation", BWL 13 "Specialization in Finance", BWL 16 "Advanced Management"	Elective	60 h (4 CH)	120
4		Practical Training	Compulsory	90 h (6 CH)	0
4	Module Profile:				
	<p>Purpose of the module/integration into curriculum: This specialization deepens the student's knowledge from various other courses, especially those from business administration and the first two semesters.</p> <p>Course content: The student can choose from the following courses of the Bachelor studies for business administration:</p> <ul style="list-style-type: none"> • BWL 3 Controlling (6 CP, WS) • BWL 7 Corporate Finance (6 CP, SS) • BWL 9 Quantitative Marketing (6 CP, SS) • BWL 10 Management und Governance (6 CP, WS) • BWL 11 Advanced Accounting (6 CP, WS) • BWL 12 Advanced Taxation (6 CP, WS) • BWL 13 Specialization in Finance (6 CP, SS) • BWL 14 Insurance Economics (6 CP, SS) • BWL 15 Advanced Marketing (6 CP, SS) • BWL 16 Advanced Management (6 CP, SS) • BWL 32 Business Ethics (6 CP, WS) <p>In these courses, topics from the area of the module (accounting, finance, management, marketing) are covered. In addition, students have to participate in a business administration-</p>				

	oriented internship of at least six weeks (15 h/week) in a company. The topics covered in the internship have to be related to at least one course listed above.																					
5	<p>Learning outcomes:</p> <p>Academic: Students deepen their knowledge of selected areas in the field of business administration (see above) and the courses of the first study year. Application of knowledge and development of related topics are focused.</p> <p>Soft skills: The acquired soft skills and qualifications depend on the selected course.</p>																					
6	<p>Description of possible electives within the modules: One course from the field of business administration has to be chosen (see Module Profile).</p>																					
7	<p>Examination: Examinations for every part of the module</p>																					
8	<p>Relevant Work:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Number and Type; Connection to Course</th> <th>Duration</th> <th>Part of final mark in %</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Modules BWL 3, BWL 6, BWL 7, BWL 10, BWL 13, BWL 14, BWL 32: written exam</td> <td>max. 120 min.</td> <td>100 %</td> </tr> <tr> <td>2</td> <td>BWL16: presentation of case study in group</td> <td>maximum of 50 powerpoint slides and 45 min.</td> <td>40 %</td> </tr> <tr> <td>3</td> <td>BWL16: written exam</td> <td>90 min.</td> <td>60 %</td> </tr> </tbody> </table>			No	Number and Type; Connection to Course	Duration	Part of final mark in %	1	Modules BWL 3, BWL 6, BWL 7, BWL 10, BWL 13, BWL 14, BWL 32: written exam	max. 120 min.	100 %	2	BWL16: presentation of case study in group	maximum of 50 powerpoint slides and 45 min.	40 %	3	BWL16: written exam	90 min.	60 %			
No	Number and Type; Connection to Course	Duration	Part of final mark in %																			
1	Modules BWL 3, BWL 6, BWL 7, BWL 10, BWL 13, BWL 14, BWL 32: written exam	max. 120 min.	100 %																			
2	BWL16: presentation of case study in group	maximum of 50 powerpoint slides and 45 min.	40 %																			
3	BWL16: written exam	90 min.	60 %																			
9	<p>Study Work: none</p>																					
10	<p>Prerequisites for Credit Points: The credit points will be granted after all relevant work and study work have been successfully completed.</p>																					
11	<p>CP Assignment:</p> <table border="1"> <tbody> <tr> <td rowspan="4">Presence</td> <td>No 1 (on choice)</td> <td>2.00 CP</td> </tr> <tr> <td>No 2 (on choice)</td> <td>3.00 CP</td> </tr> <tr> <td>No 3 (on choice)</td> <td>2.00 CP</td> </tr> <tr> <td>No 4 (on choice)</td> <td>3.00 CP</td> </tr> <tr> <td rowspan="3">Relevant Work</td> <td>No 1 (depending on choice)</td> <td>4.00 CP</td> </tr> <tr> <td>No 2 (depending on choice) and</td> <td>1.50 CP</td> </tr> <tr> <td>No 3</td> <td>2.50 CP</td> </tr> <tr> <td>Total</td> <td></td> <td>9 CP</td> </tr> </tbody> </table>			Presence	No 1 (on choice)	2.00 CP	No 2 (on choice)	3.00 CP	No 3 (on choice)	2.00 CP	No 4 (on choice)	3.00 CP	Relevant Work	No 1 (depending on choice)	4.00 CP	No 2 (depending on choice) and	1.50 CP	No 3	2.50 CP	Total		9 CP
Presence	No 1 (on choice)	2.00 CP																				
	No 2 (on choice)	3.00 CP																				
	No 3 (on choice)	2.00 CP																				
	No 4 (on choice)	3.00 CP																				
Relevant Work	No 1 (depending on choice)	4.00 CP																				
	No 2 (depending on choice) and	1.50 CP																				
	No 3	2.50 CP																				
Total		9 CP																				
12	<p>Weight of the module grade for the overall grade: 9/180 (5%)</p>																					

13	<p>Module Prerequisites: This module cannot be combined with Module VM P (approved internship), as one of the specializations chosen has to comprise a seminar (PO 2010 §7 (2)).</p>	
14	<p>Presence: See description of the corresponding business administration module.</p>	
16	<p>Responsible Lecturer: Prof. Dr. Dr. h.c. Dr. h.c. Jörg Becker</p>	<p>Department: School of Business and Economics</p>
17	<p>Misc.: A written confirmation of the company where the internship took place is required. That confirmation has to describe the length of the internship (min 6 weeks, 15 hours per week) and reassure that the internship was performed in the area of business administration. For this, the confirmation should list the activities performed during the internship.</p>	

Approved Internship

Module Title english:		Approved Internship			
Course Program:		Bachelor Information Systems			
1	Module No: VM P	State: Elective	Language of Instruction: German		
2	Turn: each semester	Duration: 1 semester	Semester: 5 or 6	CP: 9	Workload (h): 270
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) 270
4	Module Profile:				
	Purpose of the module/integration into curriculum:				
	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.				
	Course content:				
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 of about 20 pages documenting how they solved the practical problem which was assigned to them. In addition, they have to present their solution in a talk of about 1 hour 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 acquainted 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	20 pages	50 %
2	Presentation	1h	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	0.00 CP
	Relevant Work	No 1	4.50 CP
		No 2	4.50 CP
	Total		9 CP
12	Weight of the module grade for the overall grade: 9/180 (5%)		
13	Module Prerequisites: This module cannot be combined with Module VM BWL (spezialization Business Administration), as one of the specializations chosen has to comprise a seminar (PO 2010 §7 (2)).		
14	Presence: Presence at the collaborating enterprise is mandatory.		
15	Mobility/Acknowledgement:		
	Use of the module for other course programs	none	
16	Responsible Lecturer: Prof. Dr. Herbert Kuchen		Department: School of Business and Economics
	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.		

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: 5 or 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 Profile:				
	<p>Purpose of the module/integration into curriculum: The contents of the previous modules will be used in the bachelor thesis.</p> <p>Course content: 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.</p>				
	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:				
	<p>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.</p> <p>Soft skills: (among others) writing scientific texts, time management, self-competence</p>				
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 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	<table border="1"> <tr> <td colspan="3" data-bbox="209 383 1444 461">CP Assignment:</td> </tr> <tr> <td data-bbox="209 461 635 517">Presence</td> <td data-bbox="635 461 1031 517">No 1</td> <td data-bbox="1031 461 1444 517">0.00 CP</td> </tr> <tr> <td data-bbox="209 517 635 573">Relevant Work</td> <td data-bbox="635 517 1031 573">No 1</td> <td data-bbox="1031 517 1444 573">12.00 CP</td> </tr> <tr> <td data-bbox="209 573 635 629">Total</td> <td data-bbox="635 573 1031 629"></td> <td data-bbox="1031 573 1444 629">12 CP</td> </tr> </table>		CP Assignment:			Presence	No 1	0.00 CP	Relevant Work	No 1	12.00 CP	Total		12 CP
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: 12/180 (6.67%)													
13	Module Prerequisites: none													
14	Presence: none													
15	<table border="1"> <tr> <td colspan="2" data-bbox="209 978 1444 1057">Mobility/Acknowledgement:</td> </tr> <tr> <td data-bbox="209 1057 831 1124">Use of the module for other course programs</td> <td data-bbox="831 1057 1444 1124">none</td> </tr> </table>		Mobility/Acknowledgement:		Use of the module for other course programs	none								
Mobility/Acknowledgement:														
Use of the module for other course programs	none													
16	Responsible Lecturer: Prof. Dr. Herbert Kuchen	Department: School of Business and Economics												
17	Misc.:													