



Module Handbook

Bachelor of Business Informatics (wiB)

Faculty of Informatics
Reutlingen University

Degree Programme

Bachelor of
Business Informatics (wiB)

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The information that follows contains detailed descriptions of the individual modules in the degree programme. Unless otherwise specified, the assessments that need to be completed in the modules are graded.

Module list:

Semester	Module/Lecture	ECTS
1st semester		
WIB0011	Principles and Methods of Business Informatics	5
WIB0021	Principles of Economics	8
WIB0031	Principles of Informatics	8
WIB0041	Mathematical Principles	9
2nd semester		
WIB0051	Principles of Marketing and Corporate Communication	5
WIB0061	Bookkeeping and Accounting	5
WIB0121	Computer Networks	5
WIB0081	Advanced Programming	7
WIB0091	Mathematics for Business	8
3rd semester		
WIB0101	Logistics and Production	8
WIB0111	Software Engineering and Project Management	5
WIB0071	Web Programming	5
WIB0131	Systems und Security	5
WIB0141	Database Systems	7
4th semester		
WIB0151	Legal Aspects of IT	3
WIB0161	Rhetoric and Communication Practices	5
WIB0171	Scientific Research	3
WIB0181	Industrial Placement	19
5th semester		
WIB01091	Finance and Internal Reporting	6
WIB0201	Company Modelling	9
WIB0211	Distributed Systems	8
WIB0221	Project	7
6th semester		
WIB0231	Management and Controlling	6
WIB62	Electives 1	6
WIB63	Electives 2	6
WIB65	Thesis	12

Curriculum chart for Bachelor of Business Informatics

- Each module is represented by a block. The module name appears at the top left.
- The colours represent the subject category that each module falls into (see the key).
- Weekly hours per semester: The information at the bottom left of each module block indicates how many semester hours per week (SWS) are allocated to the module.
- Credits: The horizontal scale at the bottom indicates how many credits (ECTS) each module is worth.

Business Informatics																															
Graduation as Bachelor of Science											Semester																				
6	Electives 1 4 SWS	Electives 2 4 SWS	Bachelor's Thesis									Management and Controlling 4 SWS	6																		
5	Distributed Systems 6 SWS		Company Modelling 6 SWS		Project 4 SWS		Finance and Internal Reporting 4 SWS				5																				
4	Legal Aspects of IT 2 SWS	Rhetoric and Comm. Practices 4 SWS	Scientific Research 2 SWS	Praxisphase 2 SWS								4																			
3	Database Systems 6 SWS		Systems and Security 4 SWS		Web Programming 3 SWS		Logistics and Production 6 SWS		Software Eng. and Project Man. 4 SWS			3																			
2	Computer Networks 3 SWS		Advanced Programming 5 SWS			Mathematics for Business 5 SWS		Principles of Marketing and Corp. Comm. 4 SWS		Bookkeeping and Accounting 4 SWS			2																		
1	Principles of Informatics 6 SWS		Mathematical Principles 6 SWS			Principles & Methods of Business Inf. 4 SWS		Principles of Economics 6 SWS					1																		
ECTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	ECTS

SWS = semester hours per week (45 minutes)

1 ECTS represents 30 hours of work (contact time & independent study)

Thesis
Interdisciplinary
Business Inf.
Business
Informatics

Module:	Principles and Methods of Business Informatics	
	0011	
Code:		
Subtitle:	Introduction to Business Informatics and Social Aspects of Business Informatics	
Course elements:	Lectures: Introduction to business informatics Lectures: Social aspects of business informatics	
Semester:	Every semester	
Module coordinator:	Prof. Dietmar Bönke	
Lecturer:	Prof. Dietmar Bönke and other professors	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 1st semester	
Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Lectures	2 SWS
Total hours:	Contact time	60 hours
	Independent study	90 hours
Credits:	5 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written coursework, presentation	

Module objectives:

This introductory module on the principles of business informatics teaches a fundamental understanding of this subject and basic design approaches that can be taken to it. Working from an interdisciplinary perspective, students gain a broad knowledge of the subject as well as insights into its branches.

This enables them to achieve the basic objectives of an education in business informatics, incorporating a range of scientific and practical methods that will put them in a strong long-term position when they graduate. One crucial element of the module is that students acquire abstraction and modelling abilities for the purpose of performing practical analyses and designing business processes as well as the information systems associated with them.

Learning outcomes:

Knowledge:

- Be familiar with the knowledge-related and design-related objectives associated with business informatics.
- Be able to apply a top-down approach to overall understanding.
- Be familiar with company-related information and communication systems.
- Be able to follow the logical structure of areas of business administration within intracompany and intercompany value-added chains.
- Understand IT-based process design methods.
- Be able to discuss social issues and basic terms.
- Be able to derive ethical guidelines for business informatics.
- Be familiar with and understand the structure and operation of standard office applications.
- Be familiar with numbering systems as well as basic terms used in logic contexts and computer structures.

Skills:

Students learn which knowledge-related and design-related objectives are associated with business informatics as a scientific discipline. They are able to identify relationships between business informatics and other disciplines. An important element involves recognising where there is potential to reshape business informatics processes in the relationships that exist between theory and application, and between information-related and technical/functional aspects.

The intention is to provide an introduction to the basic ideas and methods associated with business informatics. Module participants are taught that there are different perspectives (paradigms) underpinning the individual disciplines.

Students must be able to contextualise the components and structural principles of operational information systems. They should prepare and deliver short presentations and projects. For this purpose, they are made aware of the standard structuring and presentation criteria that apply in scientific contexts.

Students must be able to read technical English relating specifically to the discipline, and engage in confident written and spoken communication with English-speaking partners.

Module participants are given a systematic overview of the principles underpinning business informatics and other development approaches to this discipline, enabling them to identify their own logical links between what they learn here and the subject matter covered in other modules.

Competencies:

After completing this module, students will be able to do the following:

LO#	Learning outcome (LO)	Assessed through
LO1	Be familiar with the knowledge-related and design-related objectives associated with business informatics.	Presentation or other oral assessment
LO2	Apply a top-down approach to overall understanding.	Presentation or other oral assessment
LO3	Demonstrate knowledge of company-related information and communication systems.	Written work (private study project, laboratory work or test)
LO4	Follow the logical structure of areas of business administration within intracompany and intercompany value-added chains.	Written work (private study project, laboratory work or test)
LO5	Understand IT-based process design methods.	Presentation or other oral assessment

LO6	Discuss social issues and basic terms.	Presentation or other oral assessment
LO7	Derive ethical guidelines for business informatics.	Presentation or other oral assessment
LO8	Be familiar with and understand the structure and operation of standard office applications.	Written work (private study project, laboratory work or test)
LO9	Demonstrate knowledge of numbering systems as well as basic terms used in logic contexts and computer structures.	Written work (private study project, laboratory work or test)

Content:

This module provides an introduction to business informatics as a scientific discipline. It presents the knowledge-related and design-related objectives associated with business informatics. Students are also shown how the subject relates to and differs from other scientific disciplines. Key subsystems within company-related information and communication systems are presented and linked to an overall understanding of the subject using a top-down approach. This includes hardware and software components, plus infrastructure architectures for informatics environments designed to provide solutions for company tasks. The module presents selected areas of business administration that have particular relevance to this field of study, helping students foster an understanding of the logical structure of intracompany and intercompany value-added chains. One particular area of focus is how workflows can be supported using IT-based process design.

The module discusses social issues and basic terminology, as well as the concept of scientific and economic information. It addresses knowledge-related objectives as well as philosophical and ethical aspects of business informatics. As well as this, it derives ethical guidelines for business informatics.

Students look at numbering systems as well as basic terms used in logic contexts and computer structures.

They learn about the structure and operation of standard office applications (text editing, spreadsheets, presentations, databases) and how to link applications and tasks to script languages.

Forms of media:

The module takes the form of a moderated series of lectures. Expert representatives of various disciplines teach specific approaches and ways of thinking. There is an emphasis on the various methods used for structuring expert knowledge and communicating it through forms of media. Discipline-specific materials are used to aid students' understanding of the approaches and ways of thinking in question.

Literature:

- Lehner, Franz; Wildner, Stephan; Scholz, Michael (2007): Wirtschaftsinformatik. Eine Einführung. Munich, Vienna: Hanser.

Module:	Principles of Economics	
Code:	0021	
Subtitle:	Introduction to Economics	
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Baltzer-Fabarius	
Lecturer:	Prof. Baltzer-Fabarius	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 1st semester	
Mode of teaching/semester hours per week (SWS):	Lectures	6 SWS
Total hours:	Contact time	90 hours
	Independent study	150 hours
Credits:	8 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination	

Module objectives:

This module provides an introduction to economics and lays the foundation for students moving on to more advanced studies of the subject. There are opportunities to explore the subject in depth on this basis.

Learning outcomes:

Knowledge:

- Be familiar with the basic terminology used by economists.
- Be familiar with basic business terminology.
- Be able to explain the structures and workflows used in companies and their divisions.
- Be able to single out the specific features defining public and private companies as legal and social organisations.
- Be able to describe macroeconomic and microeconomic objectives, as well as economic and business-related approaches.
- Be familiar with basic economics terminology and understand how it relates to economic activities.

- Be able to explain the issues associated with macroeconomic management and its implications for competition, the labour market and distribution policy.
- Be able to explain the challenges posed by a globalised economy.

Skills:

Students are aware of the basic procedures and key tools used by various divisions within a company (for example, strategic planning tools including product lifecycle analysis, portfolio matrix and experience curves, polarity profiles when appointing staff, structure organigrams, calculations of the ideal economic order quantity according to the Andler Formula, creating ABC/XYZ analyses, production processes and types, tools used in the marketing mix, the structure of profit and loss statements as well as balance sheets in smaller-scale cases, management accounting, cost apportionment statements), and are able to interpret and apply these. They recognise more recent developments and problems encountered in economic policy, are aware of the major decisions that companies need to make, and know the principles underpinning company management as well as operating processes. They know the limitations imposed on allocating resources in a free-market economy. They are able to assess and understand the impact of technical progress on the economy, plus the relationship that exists between the need for efficiency in an economic system and the societal aims of democratic communities.

Competencies:

- Have a sound ability to distinguish and interpret macroeconomic and microeconomic objectives
- Be confident in recognising economic relationships
- Have a sound ability to describe and understand the structure of companies and their business processes, based on various company divisions
- Demonstrate improved communication and rhetoric skills as a result of short presentations.

Content:

Students must be able to familiarise themselves with the basics of economics in a condensed format. They must acquire knowledge of all the main subject areas within economics, which are taught in a clear format, and experience them in practice. They are also taught the principles of macroeconomic thinking. The individual subjects addressed in the lectures are:

- History of economics, plus its methodology and basic terms.
- How economics fits into the overall discipline of science.
- Distinguishing between microeconomics and macroeconomics; modelling.
- Microeconomic theory; principles of market, price and competition theory, plus the theory of economic order.
- Macroeconomic theory (national accounts, classical/neoclassical theory, Keynesian theory).
- The limitations imposed on allocating resources in a free-market economy; environmentally focused market economics.
- Recent developments, problems faced in economic policy.
- Major decisions for companies.
- Company management and operating processes.
- Organisational development and human resources.
- Materials handling and the production industry.
- Distribution management.
- Accounting and controlling.

Forms of media:

The module is held in a range of alternating formats:

Each session starts by spending around 15 minutes discussing financial news items that have arisen during the previous week.

This is followed by a conventional lecture format, conducted by the lecturer and involving visual aids in the form of images on the board, overhead slides and PC-based projection, plus film/video where required (approx. 3–4 SWS).

Short presentations on basic economic subjects are given (by 2 students working together on a topic in each case); these are followed by a discussion of the contents and the presenters' performance. This provides students with an opportunity – as early as the first semester – to work together with other students, gain a logical understanding of and an ability to illustrate complex subjects, and exercise their skills in speaking without a script (approx. 1 SWS).

Students work on brief business-related case studies using the methods they have learned, in groups of 3 to 5 students, and then discuss their findings (approx. 1 SWS).

There is also an excursion to an industrial company that engages in production activities (1 full day at the end of the lecture period).

Literature:

- Wobbermin, M. (2005): *BWL im Überblick*. Schäffer – Poeschel Verlag, Stuttgart.
- Vahs, D.; Schäfer – Kunz, J. (2012): *Einführung in die Betriebswirtschaftslehre*. Schäffer – Poeschel Verlag, Stuttgart, 6th edition.
- Wöhe, G.: *Einführung in die allgemeine Betriebswirtschaftslehre*. Verlag Franz Vahlen, Munich
- Woll, A. (2013): *Volkswirtschaftslehre*. Verlag Franz Vahlen, Munich, 25th edition.

Module:	Principles of Informatics	
Code:	0031	
Subtitle:	Programming, Algorithms and Data Structures	
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Helmut Seichter	
Lecturer:	Prof. Helmut Seichter	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 1st semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	90 hours
	Independent study	150 hours
Credits:	8 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination Practical sessions: Written coursework	

Module objectives:

Students must be able to understand problems and develop solutions using object-oriented programming language. They must develop an understanding of the basic mechanisms and gain an introduction to the systematic, structured working methods and ways of thinking that are applied when dealing with computers. This creates an indispensable foundation for virtually every other course.

Learning outcomes:

Knowledge:

Know standard data types.

Know the development cycle involved in creating software.

Know the basic principles of structured programming.

Understand the fundamental principles of object orientation, classification, encapsulation, inheritance and polymorphism.

Know the impact of data organisation within computers (storage space, addressing).

Skills, competencies:

Be able to adhere to the syntax of a programming language.

Be able to select data types that are appropriate for a given problem.

Be able to abstract problems and prepare them for processing using a computer.

Be able to develop small-scale programs and check that they are semantically accurate.

Be able to apply object orientation to problem structuring.

Be able to apply interfaces and exceptions in an appropriate manner.

Content:

Syntax, development cycle, storing numbers and text, control structures, general data structures and classes, algorithms and methods, inheritance, interfaces, exceptions.

Forms of media:

- Lectures in order to present new content.
- Discussion of exercises designed to reinforce what has been learned.
- Practical sessions on applying content and training informatics skills.

Literature:

- Dietmar Ratz et al. (2011): Grundkurs Programmieren in Java. Carl Hanser Verlag; Auflage: 6th edition, updated and expanded
- Hanspeter Mössenböck (2014): Sprechen Sie Java? dpunkt.verlag; Auflage: 5th edition, revised and expanded.
- Christian Ullenboom (2014): [Java ist auch eine Insel](#). Galileo Computing; 11th edition

Module:	Mathematical Principles	
Code:	0041	
Subtitle:	Statistics and Discrete Mathematics	
Course elements:	Lectures on discrete mathematics Lectures on statistics Practical sessions on discrete mathematics and statistics	
Semester:	Every semester	
Module coordinator:	Prof. Bernhard Mößner	
Lecturer:	Prof. Bernhard Mößner Prof. Eckhard Ammann	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 1st semester	
Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Lectures	2 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	90 hours
	Independent study	180 hours
Credits:	9 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination Lectures: Written examination	

Module objectives:

Solid foundation for studying business administration:

Students are taught teaching key statistical terms used in economics.

Solid foundation for studying informatics:

Discrete mathematics lectures teach students the formal, strongly mathematics-based principles of their subject.

Wide-ranging, interdisciplinary specialist knowledge:

Students become familiar with the subject areas within mathematics and statistics, and the ways of thinking behind them.

Comprehensive methodological skills:

Students become familiar with statistical methods of describing economic issues and contexts. They also learn how to apply these in practical exercises. They learn mathematical methods of axiomatics and deduction, two principles that are essential to informatics. Through practical exercises, they learn the importance of adopting systematic, methodological, logically correct procedures when solving problems.

Social and communication skills:

Written tasks and practical work on PCs encourage students to discuss their work and possible solutions with one another and develop them in small groups.

Creative and problem-solving skills:

Working through exercises trains students' problem-solving skills. Some of the exercises may be designed to help them develop their own solutions.

Learning outcomes:

Knowledge:

- Knowledge of basic models and methods used in statistics.
- Basics of formal systems that can be used for mathematical modelling.
- Handling regression calculation, time series and index numbers.
- Awareness of, understanding of and ability to deal with propositional and predicate logic issues.
- Ability to solve tasks on set theory and relations.

Skills:

Students are able to illustrate subjects using statistical methods, investigate them and work on them using formal systems.

Competencies:

After completing this module, students will be able to evaluate the significance of statistical statements. They will be able to interpret formal systems used in selected examples of modelling. Students will be able to develop solutions for tasks and present them, working either independently or in small groups.

LO#	Learning outcome (LO)	Assessed through
LO1	Acquire a good command of basic terminology used in statistics	Written examination
LO2	Handle characteristic variables, regression lines and time series	Written examination
LO3	Understand the basic terminology used in probability calculation	Written examination
LO4	Be able to apply the basic methods of inferential statistics	Written examination
LO5	Handle formulae relating to propositional logic and predicate logic	Written examination
LO6	Handle quantities, relations and functions	Written examination
LO7	Be able to apply techniques for furnishing proof	Written examination

Content:

Statistics lectures describe features that occur in isolation and coincide with one another in relation to regression calculation, time series and index numbers. Lectures in discrete mathematics, meanwhile, provide an introduction to propositional and predicate logic, set theory, and relations. Exercises teach students the practical applications of what they learn in lectures.

Forms of media:

Lectures plus accompanying practical sessions. Teaching in seminar format with writing on the board, overhead projection and PC-based projection. Students work through written and PC-based exercises in their own time, either individually or in groups. Some tasks are set by students or lecturers during practical sessions by writing them on the board. There should also be scope to discuss unresolved questions and problems. Preparatory work or more in-depth work is carried out on some subjects in a PC laboratory. During the practical sessions, most statistics tasks are carried out on PCs using Excel.

Materials for lectures and practical sessions provided in printed and/or electronic format: brief lecture notes, exercises for practical sessions, Excel sheets with raw data for statistics, plus sample solutions to some tasks.

Literature:

- Bley Müller, Josef; Gehlert, Günther; Gülicher, Herbert (2004): Statistik für Wirtschaftswissenschaftler. 14th edition revised. Munich: Vahlen (WiSt-Studienkurs).
- Dassow, Jürgen (2005): Logik für Informatiker. 1st edition. Stuttgart, Leipzig, Wiesbaden: Teubner (Lehrbuch Mathematik).
- Meinel, Christoph; Mundhenk, Martin (2006): Mathematische Grundlagen der Informatik. Mathematisches Denken und Beweisen - eine Einführung. 3rd edition, revised and expanded. Wiesbaden: Teubner (Lehrbuch Informatik).
- Monka, Michael; Voß, Werner (2005): Statistik am PC. Lösungen mit Excel 97 2000 2002 und 2003. 4th edition, updated. Munich, Vienna: Hanser.
- Nehrlich, Werner (2003): Diskrete Mathematik. Basiswissen für Informatiker; eine Mathematica-gestützte Darstellung; mit 248 Aufgaben und zahlreichen Beispielen; [CD-ROM mit 55 Mathematica-Anwendungen und Lösungen]. Munich, Vienna: Fachbuchverl. Leipzig im Carl-Hanser-Verl.
- Nollau, Volker (1997): Wahrscheinlichkeitsrechnung und Statistik in Beispielen und Aufgaben. Stuttgart, Leipzig: Teubner.

Module: Principles of Marketing and Corporate Communication

Code: 0051

Subtitle:

Course elements: Lectures
Practical sessions

Semester: Every semester

Module coordinator: Prof. Alexander Rossmann

Lecturer: Prof. Alexander Rossmann

Language: German

Allocation to the curriculum: Business Informatics (Bachelor's), compulsory subject, 2nd semester

Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Practical sessions	2 SWS

Total hours:	Contact time	60 hours
	Independent study	90 hours

Credits: 5 ECTS

Prerequisites in accordance with examination regulations (StuPro): None

Recommended prerequisites: 0011, 0031

Mode of assessment: Lectures and practical sessions. Presentation

Module objectives:

Customers determine the success of a company, as the benefits that are created for them result in advantages for the company. That is why practices designed to add value in a company must be entirely focused on generating added value for the customer. There are various areas in which it is possible to identify a close link between marketing, corporate communication and informatics. In this module, students start by learning about the key areas of today's marketing and communication concepts. This includes market and customer orientation as a guiding principle, relevant value-added processes within companies, as well as planning and implementing a marketing strategy. The module also addresses various areas of marketing research and practice (such as market research, incentive systems and communication policy). Finally, it looks at interfaces between marketing and informatics that are significant to the study of business informatics.

Learning outcomes:

Knowledge:

Basic theoretical principles of marketing:

- Customer orientation as a guiding corporate principle; benefits for the customer result in advantages for the company.
- Value-added processes in the company, customer value, customer equity, customer satisfaction and customer retention.
- Diagnostics processes in marketing, principles of market research, marketing information systems, marketing controlling.
- Buying behaviour of consumers and organisations.
- Marketing planning and strategy, strategic goals in marketing.
- Market cultivation strategies, market and customer segmentation, go-to-market models.
- Configuration of performance, products and services, customer solutions.
- Communication policy, communication conditions, fundamentals of communication, integrated communication.
- Commercialisation and pricing policy.
- Relevant interfaces between marketing and IT.

Skills:

Students examine fundamental subject areas drawn from marketing and corporate communication. These are taught through a combination of lecture time and practical sessions. Students explore relevant areas of marketing practice on the basis of lectures and supervised practical sessions. They assess relevant journal articles and can transfer the knowledge they have gained from these to issues drawn from company practice. Additionally, they apply the contents of the lectures to case studies through exercises. By attending lectures and applying the contents of them to case studies, students gradually increase their knowledge of this subject area.

Competencies:

After completing this module, students will be able to do the following:

LO#	Learning outcome (LO)	Assessed through
LO1	Be familiar with central subject areas in marketing research and practice, and relate them to practical issues.	Presentation, practical sessions
LO2	Analyse case studies, relate key theoretical themes to questions drawn from company practice.	Supervised group work
LO3	Apply acquired knowledge independently to their own work.	Presentation
LO4	Apply their own observations to a presentation using solid reasoning and discuss a selected topic with the group.	Presentation
LO5	Evaluate and apply the latest developments from marketing research and practice.	Case study

Content:

The lectures introduce students to current topics and questions derived from marketing and corporate communications. Marketing, corporate communications and sales are some of the most significant areas of value-added activity that companies engage in today. Examining the issues associated with them is therefore an indispensable part of a business informatics degree programme. Students start by examining relevant content in a lecture setting (LO1). Building on the lectures, the knowledge that the students have obtained is consolidated in supervised practical sessions. In general, these are based on actual case studies taken from company practice (LO2). Students also take a more intensive look at the subjects discussed in lectures and practical sessions by carrying out independent study (LO3). Over the course of the lectures, students focus

on a specific area of their own choosing. They give presentations on this area in front of the entire group at the end of the semester and discuss them jointly (LO4). Students also research scientific literature on the subject and work independently to consolidate their knowledge of the lecture contents (LO5).

Forms of media:

The teaching material consists of slide notes presented in electronic format, sheets for supervised practical sessions, and additional literature on relevant subjects. The module consists of lectures with accompanying practical sessions. Teaching is conducted in a seminar format, with theoretical content illustrated using multimedia examples. Students work through exercises relating to the subject matter either individually or in groups. They are required to work on a presentation on a specific topic over several weeks, with the intention of introducing them to bigger tasks.

Literature:

- Belz, Christian; Bieger, Thomas (2006): Customer-Value. Kundenvorteile schaffen Unternehmensvorteile. 2nd edition, updated. Landsberg am Lech, [Heidelberg]: mi-Fachverl.
- Bruhn, Manfred (2013): Relationship Marketing. Das Management von Kundenbeziehungen. 3rd edition, fully revised. Munich: Vahlen (Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften).
- Kotler, Philip; Keller, Kevin Lane; Bliemel, Friedhelm (2010): Marketing-Management. Strategien für wertschaffendes Handeln. 12th edition, updated [reprint]. Munich: Pearson Studium (wi - Wirtschaft).
- Zerfaß, Ansgar; Piwinger, Manfred (2014): Handbuch Unternehmenskommunikation. Strategie - Management – Wertschöpfung. 2nd edition, fully revised. 2014. Wiesbaden: Gabler Verlag (SpringerLink: Bücher).

Module: Bookkeeping and Accounting

Code: 0061

Subtitle: Bookkeeping and Accounting

Course elements: Lectures

Semester: Every semester

Module coordinator: Prof. Michael Wobbermin

Lecturer: Prof. Michael Wobbermin

Language: German

Allocation to the curriculum: Business Informatics (Bachelor's), compulsory subject, 2nd semester

Mode of teaching/semester hours per week (SWS): Lectures 4 SWS

Total hours: Contact time 60 hours
Independent study 90 hours

Credits: 5 ECTS

Prerequisites in accordance with examination regulations (StuPro): None

Recommended prerequisites: 0021

Mode of assessment: Lectures: Written examination

Module objectives:

The lectures in this module provide an introduction to external accounting practices in line with national and international law.

Learning outcomes:

Knowledge:

- Students become familiar with the basic principles of accounting in accordance with the German Commercial Code, and are given an introduction to the key principles of international accounting.
- They learn methods of entering inventory costs.
- They acquire the ability to enter items in outturn accounts.
- They are able to recognise business transactions carried out during the course of the year.
- They are familiar with and able to create a standard annual financial statement in line with the German Commercial Code.
- They are aware of, understand and are able to apply fundamental issues relating to IFRS.

Skills:

Students know how to enter items in stock accounts and outturn accounts. They are able to recognise business transactions taking place during the course of the year and incorporate them into an annual financial statement in line with the German Commercial Code. They are able to handle fundamental issues relating to International Financial Reporting Standards (IFRS).

Competencies:

Students develop the technical and methodological competencies they need in order to apply the business knowledge they have acquired to bookkeeping and accounting scenarios. They are able to prepare an annual financial statement in line with the German Commercial Code. They are able to assess the significance of information provided by financial accounting activities.

After completing this module, students will be able to do the following:

LO#	Learning outcome (LO)	Assessed through
LO1	Demonstrate the skills they have learned in a written examination.	Written examination
LO2	Assess the problems and limitations that have been addressed in lectures.	Written examination
LO3	Communicate and discuss developments and structuring decisions from a sound scientific standpoint.	Written examination
LO4	Grasp and evaluate current developments in bookkeeping and accounting.	Written examination

Content:

- Demonstration of principles, processes and procedures involved in bookkeeping/accounting on the basis of lectures and case studies/practical sessions.
- Entering items in stock accounts.
- Entering items in outturn accounts.
- Recognising business transactions over the course of the year.
- Annual financial statements in line with the German Commercial Code.
- Principles according to IFRS.

Forms of media:

Lectures with practical sessions. Lectures on the basis of a dedicated booklet containing basic information. Copies of tasks with solutions.

Literature:

- Deitermann, Manfred; Schmolke, Siegfried; Rückwart, Wolf-Dieter (2014): Industrielles Rechnungswesen IKR. 43rd edition revised. Braunschweig: Winklers (Kaufmännisches Rechnungswesen).
- Kresse, Werner; Leuz, Norbert; Klein, Werner (2010): Steuerrecht, Internationale Rechnungslegung. Bilanzbuchhalter (IHK) mit Aufgaben und Lösungen. 11th edition revised. Stuttgart: Taylorix Fachverl (Die neue Schule des Bilanzbuchhalters, 2).
- Wobbermin, Michael (2008): Grundlagen der Buchhaltung und Bilanzierung. Mit Fallstudie. Munich, Vienna: Oldenbourg (Lehrbuch).

Module:	Computer Networks	
Code:	0121	
Subtitle:		
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Helmut Seichter	
Lecturer:	Prof. Helmut Seichter	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 2nd semester	
Mode of teaching/semester hours per week (SWS):	Lectures:	3 SWS
Total hours:	Contact time:	45 hours
	Independent study:	105 hours
Credits:	5 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination	

Module objectives:

This module provides an introduction to the basic structures involved in communication between computers. It explains key terms and procedures using examples. It addresses everything required to understand how Internet technology works.

Learning outcomes:

Knowledge:

- Know the principles of data communication.
- Understand protocols.
- Be familiar with and able to explain LAN and WAN.
- Be able to describe network architectures.
- Be familiar with the technical principles underpinning the Internet.

Skills, competencies:

- Be able to apply the key principles of computer-based communication.
- Be able to understand the processes involved in designing communication systems and recognise problems.

- Be able to classify and identify layers.
- Understand the reasons behind certain responses, be able to assess which procedures are most likely to have success, and be able to communicate with specialists in order to meet certain goals.

Content:

Principles of data communication, protocols, layer models, LAN and WAN, network architectures, technical principles of the Internet.

Forms of media:

Lectures with practical demonstrations; presentations on selected topics; extensive notes; slides; supervised tasks and exercises.

Literature:

- Andrew S. Tanenbaum (2012): *Computernetzwerke*. Pearson Studium Auflage: 5th edition, updated
- James F. Kurose, Keith W. Ross (2014): *Computernetze*, Pearson Studium; Auflage: 6th edition, updated
- Erich Stein (2007): *Taschenbuch Rechnernetze und Internet*, Carl Hanser Verlag GmbH & Co. KG; Auflage: 3rd edition, newly revised

Module:	Advanced Programming	
Code:	0081	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Martin Schmollinger	
Lecturer:	Prof. Martin Schmollinger	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 2nd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	3 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	75 hours
	Independent study	150 hours
Credits:	7 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	0031	
Recommended prerequisites:	0011, 0041	
Mode of assessment:	Written examination and written coursework	

Module objectives:

This module aims to enhance students' understanding of informatics principles. In particular, it consolidates and expands upon the skills associated with object-oriented programming. It also aims to help students develop an awareness of how to design and implement efficient algorithms and data structures. Additionally, it sets out to improve their skills when using an actual programming platform (currently Java). It requires students to have acquired the competencies taught in the Principles of Informatics module. The modules entitled Databases, Systems and Security, and Distributed Systems then build on the competencies acquired in this module.

Learning outcomes:

Knowledge:

- Knowledge of object technology, particularly the general design pattern approach.
- Knowledge of fundamental methods and the key notation elements used in the UML.
- Knowledge of methods for estimating the runtime of algorithms.
- Knowledge of basic algorithms and data structures, plus their implementation variants.

- Knowledge of the typical structure and functions of libraries for graphical user interfaces, file system access, algorithms and data structures.

Skills:

Students are able to design and implement object-oriented programs using a current programming language or platform within a professionally integrated development environment. They are able to use some specific design patterns as well as basic efficient algorithms and data structures. As well as this, they are able to implement basic graphical user interfaces in their application and store data in a file system.

Students analyse the runtime of algorithms by applying methods they have learned. They are also able to implement basic algorithms and data structures efficiently.

Competencies:

This module helps students attain the technology skills they require and strengthens their basic knowledge of informatics. Object-oriented analysis and design, as well as processes for analysing the runtime of algorithms, promote their methodological skills. As well as this, group work in practical sessions encourages the development of social skills.

After completing this module, students will be able to produce an object-oriented program design, plus its implementation, in relation to a specific problem.

LO#	Learning outcome (LO)	Assessed through
LO1	Confidently explain, present and discuss object-oriented designs.	Written examination/practical exercises
LO2	Be able to explain, use and implement basic design patterns.	Written examination/practical exercises
LO3	Be able to use and implement basic algorithms and data structures.	Written examination/practical exercises
LO4	Be able to evaluate algorithms and data structures with respect to their efficiency.	Written examination/practical exercises
LO5	Be able to apply libraries for key aspects of modern applications, as provided by a programming platform.	Written examination/practical exercises

Content:

This module looks at the development of object-oriented programs (Mössenböck, 2005). It introduces the subject of design patterns (Inden, 2012) (Gamma, 1995). Designs can be visualised using the UML and used to communicate with stakeholders in the software (Rupp, Zengler, & Queins, 2012). Designs are also implemented from the perspective of efficiency. The module considers processes for analysing the runtime of algorithms. Examples of algorithms and data structures for basic problems are considered, analysed, implemented and used (Saake & Sattler, 2010) (Mössenböck, 2005). Current programming platforms provide libraries for key aspects of modern applications. The module presents and applies libraries for graphical interfaces. It also discusses access to operating system resources, such as the file system (Mössenböck, 2005) (Inden, 2012). Practical sessions are conducted using current software development tools.

- Students enhance their knowledge of object-oriented programming, particularly design patterns, and designing object-oriented frameworks.
- Principles of object-oriented design using the UML.

- Programming using basic data structures (such as lists, queues and hashing).
- Graphical user interfaces.
- Use of operating system components (such as the file system).
- Use of integrated development environments (IDA) including tools.

Forms of media:

The module consists of lectures in a seminar format, which include writing on the board, overhead projection and PC-based projection, plus practical sessions that apply the content of the lectures. Practical work is conducted using the latest software development tools. The course material – lecture notes and exercise sheets – is provided in electronic format.

Literature:

- Gamma, Erich (1995): Design patterns. Elements of reusable object-oriented software. Reading, Mass.: Addison-Wesley (Addison-Wesley Professional Computing Series).
- Inden, Michael (2012): Der Weg zum Java-Profi. Konzepte und Techniken für die professionelle Java-Entwicklung. 2nd edition, updated and expanded. Heidelberg: dpunkt-Verl.
- Mössenböck, Hanspeter (2014): Sprechen Sie Java? Eine Einführung in das systematische Programmieren; dpunkt.verlag 4th edition, revised and expanded.
- Rupp, Chris; Queins, Stefan (2012): UML 2 glasklar. Praxiswissen für die UML-Modellierung. 4th edition, updated and expanded. Munich: Hanser.
- Saake, Gunter; Sattler, Kai-Uwe (2013): Algorithmen und Datenstrukturen. Eine Einführung mit Java. dpunkt.verlag GmbH; 5th edition, revised

Module:	Mathematics for Business	
Code:	0091	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Bernhard Mößner	
Lecturer:	Ms Gisela Filip	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 2nd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
	Practical sessions	1 SWS
Total hours:	Contact time	75 hours
	Independent study	165 hours
Credits:	8 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	0041	
Mode of assessment:	Lectures: Written examination Practical sessions: Written coursework	

Module objectives:

Solid foundation for studying business administration:

Students enhance their knowledge of fundamental quantitative methods used in economics.

Wide-ranging, interdisciplinary specialist knowledge:

Students become familiar with the subject areas within mathematics, and the ways of thinking behind them.

Comprehensive methodological skills:

Students become familiar with mathematical methods of modelling economic contexts – an indispensable skill in the field of economics. Through practical exercises, students learn how to create models of this kind and find solutions for them either manually or using a computer program.

Social and communication skills:

Written tasks and practical work encourage students to discuss tasks and possible solutions with one another, and develop them in small groups.

Learning outcomes:

Knowledge:

Knowledge of the basic concepts and methods used in analysis and linear algebra.
 Familiarity with, understanding of and ability to apply mathematical modelling to economic problems in selected examples.
 Sound financial mathematics skills.
 Ability to handle differential calculus and linear optimisation tasks.
 Ability to process numerical solutions to model equations.

Skills:

Students are able to transfer the mathematical methods they have learned to practical problems and apply the appropriate solutions. They practise handling financial mathematics scenarios using exercises and examples. They are also able to solve linear algebra, differential calculus and linear optimisation problems themselves. This helps them gain a deeper understanding of fundamental concepts and methods used in analysis.

Competencies:

After completing this module, students will have developed the skills they need to analyse economic problems and will be able to work with mathematical models in order to describe them. They will be able to interpret the results of the mathematical solution methods that are applied in the models. Students will be able to develop solutions for tasks and present them, working either independently or in small groups.

LO#	Learning outcome (LO)	Assessed through
LO1	Ability to handle elements of financial mathematics	Written examination
LO2	Sound knowledge of differential and integral calculus	Written examination
LO3	Knowledge of basic terminology used in linear algebra	Written examination
LO4	Understanding of the principles of linear optimisation	Written examination

Content:

This module considers several areas of financial mathematics. These include differential calculus for the functions of one or more variables, integral calculus for the functions of one variable, plus linear algebra and linear optimisation – with particular attention paid to economic modelling in each case. Examples of numerical solutions to model equations are also considered, and the module addresses the issue of calculation using numerical notations of a finite word length on a computer.

Forms of media:

Lectures plus accompanying practical sessions. Lectures are conducted in a seminar format, with information written on the board and displayed using overhead projection. Students work through written and PC-based exercises in their own time, either individually or in groups. Some tasks are set by students or lecturers during practical sessions by writing them on the board. There should also be scope to discuss unresolved questions and problems.

Materials for lectures and practical sessions provided in printed and/or electronic format:

- Brief lecture notes.
- Practical exercises.

Literature:

- Bosch, Karl (2003): Mathematik für Wirtschaftswissenschaftler. Einführung. 14nd edition, fully revised. Munich, Vienna: Oldenbourg.
- Salomon, Ehrenfried; Poguntke, Werner (2003): Wirtschaftsmathematik. [Finanzmathematik Analysis Lineare Algebra]. 2nd edition, revised and updated [reprint]. Cologne, Vienna: Fortis-Verl; Manz (Reihe Wirtschaft und Recht).
- Tietze, Jürgen (2006): Einführung in die angewandte Wirtschaftsmathematik. Mit ... 1300 Übungsaufgaben. 13th edition, revised. Wiesbaden: Vieweg (Studium).

Module:	Logistics and Production	
Code:	0101	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Herbert Glöckle	
Lecturer:	Prof. Herbert Glöckle Prof. Dietmar Bönke	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 3rd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	90 hours
	Independent study	150 hours
Credits:	8 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	0011, 0031	
Mode of assessment:	Lectures: Written examination	

Module objectives:

Students are able to understand and shape planning and manufacturing processes in various production environments and typologies. They are able to design the associated business processes and, working on this basis, devise IT systems for supporting the processes.

Learning outcomes:

Knowledge:

- Familiarity with, understanding of and ability to apply analysis methods for identifying production and logistics workflows within a company.
- Knowledge of technical reference models designed to achieve a specific purpose.
- In-depth knowledge of the most common logistics and production methods used in practice.
- Knowledge of examples of industry-specific method types.
- Knowledge of various description methods for business processes.
- Methodology for implementing a technical model in IT concepts (business/IT alignment).

Skills:

Students are able to create process models based on technical specifications. They are able to derive data models and function specifications against a technical production and logistics backdrop. They are taught how to find solutions for technical logistics and production tasks on the basis of case study scenarios. Design methods from related specialist areas of software engineering are also applied in the context of logistics and production.

Competencies:

Technical competency in logistics and production, enabling students to adopt a knowledge communicator role as a point of contact for specialist departments and as a partner in the IT department. As a result, students are also able to assess the extent to which the functions provided in standard software systems are able to meet the needs of issues encountered in practice, and where individual adaptations need to be made. This puts them in a position to make a real contribution towards identifying solutions that are ideal from a business perspective.

LO#	Learning outcome (LO)	Assessed through
LO1	Competency in logistics and production	Written assessment with technical subject matter
LO2	Competency as a point of contact for specialist departments	Processing transfer tasks in exercises and written examination
LO3	Competency as a point of contact for IT	Creating process and data models for technical purposes in exercises and written examination
LO4	Initial comparison with functions in standard systems, such as SAP ERP (used in the degree programme). Preparation for advanced study during the 5th semester on the basis of the principles set out here.	Discussion

Content:

Methodological principles for describing business processes, fundamental planning and implementation tasks during production, principles of production including business planning models and operation typologies, systems for production planning and management. Basic structures, data models and functions as well as solution architectures for implementing company goals.

Planning and monitoring production workflows; production programme planning; time management; lead time scheduling; capacity planning; production management, detailed scheduling; progress monitoring; operating data recording and waste management; development of production from programme to job production to services production; master data such as parts lists and variant parts lists; customer orders and forecasting models; material requirements planning (MRP); provision of co-products; reorder point procedures; Kanban; OPT; stock management and inventory; procurement; and auditing. Discussion of areas of interface with financial accounting. Properties of services, such as immateriality, unsuitability for storage and pronounced link with customer, plus the effects of this on business and information aspects, service marketing, and quality management.

Forms of media:

Lectures with case studies designed to teach targeted identification of solutions. Factory tour, integrated workshop with Databases course. Notes, sample application software that participants can use to develop their own typical solutions for the context.

Literature:

A continually updated list of literature sources will be provided in the lecture notes.

Module: Software Engineering and Project Management

Code: 0111

Subtitle:

Course elements: Lectures
Practical sessions

Semester: Every semester

Module coordinator: Prof. Alfred Zimmermann

Lecturer: Prof. Karlheinz Blank
Dr Michael Herrmann

Language: German

Allocation to the curriculum: Business Informatics (Bachelor's), compulsory subject, 3rd semester

Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Practical sessions	2 SWS

Total hours:	Contact time	60 hours
	Independent study	90 hours

Credits: 5 ECTS

Prerequisites in accordance with examination regulations (StuPro): None

Recommended prerequisites: 0011, 0031, 0081

Mode of assessment: Lectures: Written examination
Practical work: Presentation

Module objectives:

Every informatics specialist must have the ability to systematically develop software systems in a project context. In this module, software engineering is taught as a technological and social process along with the key skills that students are required to have. Project management skills enable informatics students to move on to roles as managers and teaches them fundamental knowledge and experience relating to programme portfolio-based initiation, planning, management, execution and monitoring, as well as methods of successfully concluding projects and programmes. Using examples of specific architectures, mechanisms and functional models for software engineering, project work is taught in a hands-on manner and applied to sample cases. Modelling languages such as the UML (Unified Modeling Language), SysML (Systems Modeling Language) and SoaML (Service-oriented architecture Modeling Language) are used in practical case studies to define specifications for software systems, in turn enabling students to create implementations using object-oriented languages such as Java (e.g. for web services). Students acquire a solid basis of methodological knowledge for project work and software engineering, accompanied by key social skills gained during project work and backed up by relevant international standards such as UML, SysML, SoaML, SWEBOK and PMBOK.

Learning outcomes:

Knowledge:

- Knowledge of products, methods, standards, processes and tools designed for forward-thinking software engineering and software project management.
- Systematic categorisation and application of subject areas within software engineering and software project management.
- Experience in handling modelling tools such as UML, SysML and SoaML.
- Identification of requirements and formulation of specifications.
- Knowledge of software process models, software design and fundamental workflows and roles in software engineering.
- Knowledge of SWEBOK (Software Engineering Body of Knowledge).
- Knowledge of fundamental issues in project management.
- Ability to work on project management tasks in a team.
- Knowledge of, understanding of and ability to apply PMBOK (Project Management Body of Knowledge).

Skills:

Students are able to take a systematic approach to categorising and applying concepts, processes and methods. Based on various projects drawn from the area of project management, students learn how to work in a project team, how to apply various modelling tools, how to identify requirements with accuracy and how to derive specifications on this basis. Case studies enable students to apply and understand software design and process models in practice. In this context, students enhance their knowledge of how to handle software engineering-specific documents, such as SWEBOK, and the working methods involved in project management. Modern-style workshop study groups provide an introduction to working as part of a team.

Competencies:

After completing this module, students will be able to assess, analyse and apply examples of the principles, methods, processes, products and roles specifically associated with software development, as well as the specific tools used in project management.

Content:

Introduction and overview with study group on the following subjects:

- UML (Unified Modeling Language) with case study 1.
- SysML (Systems Modeling Language) with practical sessions.
- SoaML (Service-oriented Architecture Modeling Language) with practical sessions.
- Identification of requirements and specifications, with practical sessions.
- Workshop case study 1: business processes, applications.
- Software design with case study 2.
- Software process models with practical sessions.
- Workshop case study 2: classifications, components, systems.
- SWEBOK (Software Engineering Body of Knowledge) with practical sessions.
- Workshop study group.

Project management:

- Introduction and overview with study group.
- Project initiation with practical sessions.
- Project planning with practical sessions.

- Project management with case study 1.
- Project monitoring with practical sessions.
- Workshop case study 1: planning a software project.
- Project completion with case study 2.
- PMBOK (Project Management Body of Knowledge) with practical sessions.
- Workshop case study 2: monitoring a software project.
- Programme management with practical sessions.
- Workshop study groups.

Forms of media:

Lectures, practical sessions, case studies, advanced conceptual work, lecture slides, books, web resources.

Literature:

- Dobiéy, Dirk; Köplin, Thomas; Mach, Wolfram (2004): Programm-Management. Projekte übergreifend koordinieren und in die Unternehmensstrategie einbinden. 1st edition. Weinheim: WILEY-VCH.
- Friedlein, Ashley (2002): Web-Projektmanagement. Systematisches Vorgehen bei der Planung Realisierung und Pflege von Websites. Heidelberg: dpunkt-Verl.
- Fowler, Martin (2004): UML Distilled. A Brief Guide to the Standard Object Modeling Language. 3rd edition. Boston: Addison-Wesley
- Gernert, Christiane (2003): Agiles Projektmanagement. Risikogesteuerte Softwareentwicklung. Munich, Vienna: Hanser (b-Agile).
- Kruchten, Philippe (1999): The Rational Unified Process. [an introduction]. Reading, Mass.: Addison-Wesley (Object Technology Series).
- Lomnitz, Gero (2001): Multiprojektmanagement. Projekte planen vernetzen und steuern. Landsberg/Lech: Verl. Moderne Industrie.
- Maciaszek, Leszek A. (2005): Requirements analysis and system design. 2nd ed. Harlow, England, Munich: Addison-Wesley.
- Maciaszek, Leszek A.; Liong, Bruce Lee; Bills, Stephen (2005): Practical software engineering. A case study approach. 1st publ. Harlow: Pearson Addison-Wesley.
- Robillard, Pierre N.; Kruchten, Philippe; D'Astous, Patrick (2003): Software engineering process with the UPEDU. Boston, Mass.: Addison-Wesley.
- Wysocki, Robert K. (2003): Effective project management. 3rd ed. New York: Wiley.
- Sommerville, Ian (2012): Software Engineering. 9th edition, updated. Munich: Pearson (Always Learning).
- Sommerville, I.: Software Engineering, Addison-Wesley 2011
- SWEBOOK Guide to Software Engineering Body of Knowledge <http://www.software-engin.com/>
- PMBOK Project Management Body of Knowledge, PMI 2013
- The PMI compendium of project management practices (2003). Newtown Square, Pa.: Project Management Institute.
- PMM Project Management Methodology, State of Michigan, Department of Information Technology, 2001 2001, <http://www.michigan.gov/>
- UML resources: <http://www.uml.org>

Module:	Web Programming	
Code:	0071	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Martin Schmollinger	
Lecturer:	Matthias Gutbrod, MSc.	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 3rd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Practical sessions	1 SWS
Total hours:	Contact time	45 hours
	Independent study	105 hours
Credits:	5 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination	

Module objectives:

This module aims to introduce students to the technology, structure and programming associated with web applications. It requires students to have acquired the competencies taught in the Principles of Informatics module. The majority of applications that companies use are web-based. The competencies that are taught in this module are essential in understanding the functions of these applications, and are therefore a crucial part of an IT specialist's career. The modules entitled Databases, Networks, Systems and Security, and Distributed Systems build on aspects of this module.

Learning outcomes:

Knowledge:

- Knowledge of web application architectures.
- Ability to name basic technologies and describe how they relate to one another.
- Fundamental knowledge of programming languages and databases for implementing web applications.
- Tools for developing web applications, and ability to understand and apply protection measures for them.

- Ability to name risks associated with web applications, as well as explain and apply appropriate countermeasures.
- Knowledge of the principles of relational databases and how they are incorporated into web applications (such as MySQL).

Skills:

Students are able to develop their own web applications using basic technology. To do this, they use standard programming platforms, tools and systems. The focus where clients are concerned is on HTML/CSS and JavaScript. Programming at the server side is conducted using current frameworks such as PHP, Java or Node.js (JavaScript). Students are able to apply basic web application technology and various approaches to web programming, with a database incorporated, and are able to put protection measures in place.

Competencies:

This module helps students attain the technology skills they require and strengthens their knowledge of programming technology and software architectures. After completing this module, students will be familiar with web application architecture and will be able to design an environment of this nature. They will be familiar with the web technologies associated with various architectural layers and will be able to use these for application development purposes, with the assistance of selected tools. They will also be aware of security issues relating to web applications.

LO#	Learning outcome (LO)	Assessed through
LO1	Confidently explain, present and discuss web application architectures.	Written examination/ practical work
LO2	Be able to use the web technologies associated with various architectural layers.	Written examination/ practical work
LO3	Be able to develop web applications using the latest programming tools.	Written examination/ practical work
LO4	Assess web applications with respect to security issues.	Written examination/ practical work

Content:

This module teaches students about the fundamental technologies associated with web applications (Balzert, 2011). It addresses basic types of technology (such as URI, HTTP, HTML and CSS) as well as selected methods of web application programming at the client and server sides (Balzert, 2011; Koch, 2011; Maurice, 2012). As well as this, it presents selected principles that are used to provide protection for web applications (Kübeck, 2011).

- Web application architectures.
- Basic types of technology: HTTP, URI/URL, HTML/CSS.
- Programming at the server side (PHP, Java, Java Frameworks, Node.js, etc.).
- Principles of relational databases and how they are incorporated into web applications (e.g. MySQL).
- Programming logic at the client side (e.g. JavaScript).
- Ajax and alternative types of technology for rich Internet applications.
- Principles of providing protection for web applications.

Forms of media:

The module consists of lectures in a seminar format, which include writing on the board, overhead projection and PC-based projection, plus practical sessions that apply the content of the lectures. Practical work is conducted using the latest software development tools. The course material is provided in electronic format:

- Lecture notes
- Exercise sheets.

Literature:

- Balzert, Heide (2011): Basiswissen Web-Programmierung. XHTML CSS JavaScript XML PHP JSP ASP.NET Ajax. Online edition. Herdecke, Witten: W3L-Verl (Informatik).
- Koch, Stefan (2011): JavaScript. Einführung Programmierung und Referenz. 6th edition, updated and expanded. Heidelberg: dpunkt-Verl (iX-Edition).
- Maurice, Florence (2014): PHP 5.5 & MySQL 5.6. Ihr praktischer Einstieg in die Programmierung dynamischer Websites. Addison-Wesley.

Module:	Systems and Security	
Code:	0131	
Subtitle:	IT Security and Operating Systems	
Course elements:	Lectures: IT security Lectures: Operating systems	
Semester:	Every semester	
Module coordinator:	Prof. Helmut Seichter	
Lecturer:	Prof. Wolfgang Blochinger.	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 3rd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
	Lectures	2 SWS
Total hours:	Contact time	60 hours
	Independent study	90 hours
Credits:	5 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination	

Module objectives:

Within the overall architecture of an IT system, operating systems represent an interfacing point with hardware. As a result, the concepts and architectures of operating systems form the basis of all higher-level software layers. A central aim of this module is to enable students to understand the key components of operating systems, the complex ways in which they work together, and what bearing they have on higher-level layers in the software stack. To make the subject matter more tangible, the module addresses the commonalities and features found in the two most popular operating systems, Windows and UNIX.

The second main focus of the module is security in IT systems, something which particularly affects operating systems and system software due to their fundamental functions. Using current examples, students are taught and discuss the major threats facing IT system security and countermeasures that can be taken against them.

Learning outcomes:

Knowledge:

- Basic functions of all the key components of operating systems.
- Operating system interfaces for creating system-oriented software.
- Major threats facing IT systems and countermeasures (particularly cryptographic techniques).

Skills:

Students are able to use standard operating systems at an advanced level and optimise their configuration with various aims in mind (such as performance and security). They are able to handle standard systems and products expertly in relation to IT security; for example, systems for encrypting files and networks.

Competencies:

Students can fully understand the role of operating systems within complex IT systems and take this into account when making design-related decisions. They are able to identify threats to the security of IT systems and assess the resulting risks as well as pinpoint suitable countermeasures.

After completing this module, students will be able to do the following:

LO#	Learning outcome (LO)	Assessed through
LO1	Understand the key components of operating systems and how they work with one another, as well as with hardware components.	Written examination
LO2	Understand the major threats facing IT systems, analyse their (potential) impact, and design suitable countermeasures.	Written examination
LO3	Communicate with specialists in relation to operating systems and IT security, with specific aims in mind.	Written examination
LO4	Stay informed about new developments and findings in the subject areas addressed by the module, and evaluate them critically.	Written examination

Content:

- Operating systems
 - Basic hardware components of a computer system
 - Tasks, classification and architecture of operating systems
 - System calls and interrupts
 - Process management
 - Threads, concurrency and synchronisation primitives
 - Storage management
 - I/O system and file management
- IT security
 - Threats, attacks and risks
 - Symmetrical and asymmetrical cryptographic techniques
 - Signatures and certificates; code management
 - Authentication, access control and security management
 - Security loopholes and malware

Forms of media:

Lecture notes and slides.

Literature:

- Mandl, Peter (2013): Grundkurs Betriebssysteme. 3rd edition. Wiesbaden: Springer-Vieweg. ISBN: 978-3-8348-1897-3.
- Tanenbaum, Andrew S. (2015): Modern Operating Systems. 4th edition. Essex: Pearson. ISBN: 978-1-292-06142-9.
- Ertel, Wolfgang (2012): Angewandte Kryptographie. 4th edition. Munich: Hanser. ISBN: 978-3-446-42756-3.
- Eckert, Claudia (2014): IT-Sicherheit. Konzepte - Verfahren - Protokolle. 9th edition. Munich: Oldenbourg. ISBN: 978-3-486-77848-9.

Module:	Database Systems	
Code:	0141	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Ilia Petrov	
Lecturer:	Prof. Ilia Petrov	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 3rd semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	90 hours
	Independent study	120 hours
Credits:	7 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	0031, 0041, 0081	
Mode of assessment:	Lectures: Written examination Practical sessions: Written coursework	

Module objectives:

This module aims to give students a general introduction to the subject of database and information systems. It also sets out to enable students to handle data models and concepts, acquire knowledge relating to the development and programming of database applications, and apply this knowledge in practice through exercises.

Learning outcomes:

Knowledge:

- Be familiar with various data models (entity relationship and relational).
- Be able to name and explain concepts underpinning object-oriented data modelling.
- Be able to describe the principle of normalisation.
- Be familiar with declarative query languages (SQL) and the concept of transactions.
- Be familiar with database interfaces and database application designs.

- Be able to describe the details of data backup and restoring measures for database systems.
- Be familiar with how to program databases using JDBC and embedded SQL.

Skills:

After attending this module, students will be able to model and design databases using methodological techniques. They put these skills into practice in sample applications. Through practical sessions, they acquire and consolidate skills relating to all the main phases of a typical database application lifecycle. Practical sessions also train students in database modelling (ER models), mapping ER diagrams onto relations, and creating database schemas. As well as this, they learn how to handle SQL and its language components (DDL, DML, DCL; the module addresses SQL as a query language, query types, and alternatives). Students learn how to handle transactions and the isolation levels associated with the SQL standard. The module also includes database interfaces such as JDBC as well as database application programming.

Competencies:

After completing this module, students will be able to model, design and implement databases using methodological techniques.

Content:

- ANSI/SPARC
- Entity-relationship model
- Object-oriented concepts and modelling
- Relational model
- Normalisation
- Semantics of relationships
- Practical design rules
- SQL (Structured Query Language)
- Transaction concepts
- Serialisability
- Two-phase locking protocol
- Data backup and restoring measures, query optimisation, programming interfaces (JDBC, embedded SQL).

Forms of media:

Seminar teaching, writing on the board, PPT presentations, demos, practical sessions, PPT slide notes, exercises, SQL learning programme.

Literature:

- Connolly, Thomas M.; Begg, Carolyn E. (2005): Database systems. A practical approach to design implementation and management. 4th ed. Harlow, England, Munich: Addison-Wesley (International Computer Science Series).
- Date, Chris J. (19XX): An introduction to database systems. Reading, Mass.: Addison-Wesley (Addison-Wesley Systems Programming Series).
- Elmasri, Ramez; Navathe, Sham (2011): Grundlagen von Datenbanksystemen. Bachelorausgabe. 3rd edition, updated, Bachelor's edition [reprint]. Munich: Pearson Studium (it Informatik).

- Härder, Theo; Rahm, Erhard (2001): Datenbanksysteme. Konzepte und Techniken der Implementierung; mit 14 Tabellen. 2nd edition, revised. Berlin, Heidelberg: Springer.
- Kemper, Alfons; Eickler, André (2011): Datenbanksysteme. Eine Einführung. 8th edition, updated and expanded. Munich: Oldenbourg-Verl.
- Vossen, Gottfried (2008): Datenmodelle, Datenbanksprachen und Datenbankmanagementsysteme. 5th edition, revised and expanded. Munich, Vienna: Oldenbourg.

Module:	Legal Aspects of IT	
Code:	0151	
Subtitle:		
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Thomas Baltzer-Fabarius	
Lecturer:	Prof. Günter Bauer	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 4th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	2 SWS
Total hours:	Contact time	30 hours
	Independent study	60 hours
Credits:	3 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written examination	

Module objectives:

In this module, students learn basic legal principles and receive an introduction to several aspects of law in the fields of business and information technology. The module provides an overview of the main legal institutions that govern civil law.

Learning outcomes:

Knowledge:

- Knowledge of the general component of the German Civil Code (declaration of intent, conclusion of contracts, representation, formal requirements, options for electronic conclusion of contracts).
- Knowledge of the characteristics specific to commercial law.
- Knowledge and understanding of property law (property, ownership and rights of lien, security rights) and procedural law.
- Knowledge of individual labour law, including initiation, conclusion, execution and termination of an employment contract, along with all rights and obligations.

- Knowledge of the principles underpinning IT and copyright law, particularly with respect to purchases and business transactions with and within the IT sector, including the principles of data protection legislation relating to permitted and non-permitted data processing.

Skills/competencies:

Students are able to use case studies to explain the characteristics that are specific to commercial law and know how a contract or a declaration of intent is concluded electronically, together with all the legally prescribed formal requirements. They are well informed in the areas of property law and procedural law, and are confident in answering questions about property, ownership and lien. Knowledge of IT and copyright law principles will enable students to complete business transactions successfully within the IT sector. They will also have a sound knowledge of the principles of data protection law.

Content:

- General component of the German Civil Code: declaration of intent, conclusion of contracts, representation, formal requirements and options for electronic conclusion of contracts.
- Characteristics specific to commercial law: the individual contract types defined by the German Civil Code, non-contractual law of obligations, damage compensation arising from tortious liability, and enrichment issues.
- Property law: ownership and property, rights of lien in relation to moveable and immoveable assets, and security rights including reciprocal influence.
- Procedural law: lawsuits and dunning procedures; enforcement instruments and proceedings.
- Individual labour law: initiation, conclusion, execution and termination of an employment contract; rights and obligations arising from employment; protection against dismissal; social security law and tax law aspects.
- IT law: warranty rights associated with purchases of computer systems and software.
- Copyright law: copyright protection for computer programs; criminal law with respect to the use of data processing systems.
- Data protection legislation: German Federal Data Protection Act and State Data Protection Acts, permitted data processing, and rights of those affected.

Forms of media:

Lectures with case studies designed to teach targeted identification of solutions. Notes, sample application software that participants can use to develop their own typical solutions for the context.

Literature:

Students will be informed of sources of literature during the course of the module.

Module:	Rhetoric and Communication Practices	
Code:	0161	
Subtitle:		
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Armin Roth	
Lecturer:	Prof. Armin Roth	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 4th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
Total hours:	Contact time	60 hours
	Independent study	90 hours
Credits:	5 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	Passes in module assessments in the 1st and 2nd semesters, and in at least 3 module assessments in the 3rd semester	
Mode of assessment:	Lectures: Papers/presentations, ungraded	

Module objectives:

The aim of this module is to raise students' awareness of the importance of communication and rhetoric. Students receive preparation for various types of communication (one-to-one meetings, group discussions, talks in an auditorium, etc.). They also learn how to prepare the speech and visual elements of content, enabling them to present projects and findings successfully in order to achieve certain aims.

Learning outcomes:

Knowledge:

Principles of communication and rhetoric:

- Teaching of the principles underpinning successful presentation, and introduction to professional dialogue.
- Knowledge of moderation techniques enable students to assume the role of moderator in discussions.

Skills:

Based on theoretical and practical examples, students are able to cultivate effective, strategic communication on a bilateral level, in a team and in an auditorium setting. They are skilled in presentation techniques designed to present findings or information successfully. Applying techniques for putting forward arguments and moderating in the communication scenario concerned enables students to become persuasive participants in communication.

Competencies:

Through experiencing and taking a hands-on approach to actual dialogue situations, students cultivate key competencies such as social skills, communication skills and teamwork skills. They are able to establish and recognise successful communication. Through reflection, they are able to identify areas of potential improvement and processes relating to the group dynamic.

LO#	Learning outcome (LO)	Assessed through
LO1	Unscripted talks.	Impromptu speeches, voicing opinions
LO2	Lecture on a specific subject.	Various presentations
LO3	Enhancement of argument-making skills.	Various roleplay exercises

Content:

This module's purpose is to teach students the principles of communication and rhetoric. It deals with presentation and dialogue techniques. It also provides an introduction to moderation techniques.

Forms of media:

Seminar, group work and individual work, roleplay, lecture slides, presentation material and moderation material.

Literature:

- Alteneder, Andreas (1996): Der erfolgreiche Fachvortrag. Didaktik Visualisierung Rhetorik. Erlangen: Publicis-MCD-Verl.
- Cialdini, Robert B. (1998): Die Psychologie des Überzeugens. Ein Lehrbuch für alle die ihren Mitmenschen und sich selbst auf die Schliche kommen wollen. 1st edition, reprint. Bern: Huber (Aus dem Programm Huber : Psychologie-Lehrbuch).
- Fey, Heinrich; Fey, Gudrun (1996): Redetraining als Persönlichkeitsbildung. Praktische Rhetorik zum Selbststudium und für die Arbeit in Gruppen. 2nd edition. Berlin, Bonn, Regensburg: Walhalla (Handbuch Qualifikation & Chance).
- Jens, Walter (1972): Von deutscher Rede. Unabridged edition. Munich: Deutscher Taschenbuch-Verlag (dtv, 806).
- Lay, Rupert (1983): Dialektik für Manager. Methoden des erfolgreichen Angriffs und der Abwehr. 11th edition revised. Munich: Wirtschaftsverlag Langen-Müller/Herbig.
- Schulz von Thun, Friedemann: Miteinander reden, Bd.1. Störungen und Klärungen. Allgemeine Psychologie der Kommunikation. Hamburg Rororo-Verlag, 2014.

Module:	Scientific Research	
Code:	0171	
Subtitle:		
Course elements:	Seminar	
Semester:	Every semester	
Module coordinator:	Prof. Friedrich Laux	
Lecturer:	Prof. Friedrich Laux	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 4th semester	
Mode of teaching/semester hours per week (SWS):	Seminar	2 SWS
Total hours:	Contact time	30 hours
	Independent study	60 hours
Credits:	3 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Seminar: Written coursework	

Module objectives:

Participants acquire skills in conducting scientific research.

Learning outcomes:

Students conduct in-depth research into a specialist subject using suitable sources. This gives them the ability to systematically explore and extract information from a subject area. They learn how to distinguish facts from claims. They are familiar with and understand the terms "hypothesis", "thesis" and "antithesis". They are able to put forward logical arguments.

Competencies:

Students are able to apply scientific research and working methods. They are able to prepare scientific work.

Content:

- Empirical and formal methods.
- Literature research.
- Correct citation.

- Plagiarism.
- Excerpting and academic writing.

Forms of media:

Seminar teaching, writing on the board, PPT presentations, demos, practical sessions, tests
Notes with PPT slides, practical sessions, sample publications.

Literature:

- Charbel, Ariane (2001): Schnell und einfach zur Diplomarbeit. Der praktische Ratgeber für Studenten. Nuremberg: BW Bildung und Wissen Verl. und Software.
- Deininger, Marcus (2005): Studien-Arbeiten. Ein Leitfaden zur Vorbereitung Durchführung und Betreuung von Studien- Diplom- Abschluss- und Doktorarbeiten am Beispiel Informatik. 5th edition, revised. Zurich: vdf Hochschulverl. an der ETH.
- Fragnière, Jean-Pierre; Lotmar, Paula (2003): Wie schreibt man eine Diplomarbeit? Planung Niederschrift Präsentation von Abschluss- Diplom- und Doktorarbeiten von Berichten und Vorträgen. 6th edition, unchanged. Bern, Stuttgart, Vienna: Haupt (Soziale Arbeit, 6).
- Lück, Wolfgang (1999): Technik des wissenschaftlichen Arbeitens. Seminararbeit Diplomarbeit Dissertation. 7th edition, edited. Munich: Oldenbourg.
- Rößl, Dietmar (2005): Die Diplomarbeit in der Betriebswirtschaftslehre. Ein Leitfaden. 3rd edition, expanded. Vienna: Facultas (manual).
- Scholz, Dieter (2001): Diplomarbeiten normgerecht verfassen. Schreibtipps zur Gestaltung von Studien Diplom- und Doktorarbeiten. 1st edition. Würzburg: Vogel.
- Theisen, Manuel René (2006): Wissenschaftliches Arbeiten. Technik - Methodik - Form; [ein Musterband: Lesen & Sehen = Wissen & Können]. 13th edition, newly revised. Munich: Vahlen (WiSt-Taschenbücher: Wirtschaftswissenschaftliches Studium).

Module:	Industrial Placement	
Code:	0181	
Subtitle:		
Course elements:	Preparatory course relating to the form and content of the industrial placement Industrial placement Follow-up: presentation, seminar for placement students	
Semester:	Every semester	
Module coordinator:	Prof. Thomas Baltzer-Fabarius	
Lecturer:	Prof. Thomas Baltzer-Fabarius Industry advisers	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 4th semester	
Mode of teaching/semester hours per week (SWS):	Seminar	2 SWS
Total hours:	Contact time	30 hours
	Independent study	540 hours
Credits:	19 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	At least 60 ECTS credits must have been earned by the time the industrial placement commences	
Recommended prerequisites:	All modules in semesters 1–3	
Mode of assessment:	Industrial placement: report on practical work, presentation on experiences	

Module objectives:

The industrial placement component of the Business Informatics degree programme teaches practical knowledge and how to apply key skills. With the involvement of suitable training organisations, it aims to provide students with practical experience of operational workflows and procedures, in a way that focuses on integrating students' knowledge of business administration and information technology for designing and/or using information and communication systems. Professors from the degree programme coordinate the industrial placement in conjunction with the training organisation supervisors. University courses are integrated into the industrial placement. It is also possible for students to complete their industrial placement abroad. Practical training usually lasts 6 months.

Learning outcomes:

Knowledge:

Students recognise the value of the industrial placement in relation to their studies of theory. They are aware of how to incorporate practical requirements into theoretical considerations. This highlights areas where theory and practice diverge in everyday business contexts. Students are aware of the procedure they need to follow in order to find an appropriate placement.

Skills:

Students are more aware of how business operations work in practice, through sample cases in selected business divisions. They applied the content of what they had studied up to that point to their industrial placement, and linked it to the requirements of the industrial placement, giving them the skills they will need to critically assess theory from a practical perspective later on in their studies.

They acquired social skills through communication with their supervisor and work colleagues, and acted as a strong and competent member of the team, discussing and taking on team activities as well as coordinating them with other team members.

Under the direction of their supervisor, they were able to solve problems arising in all areas of the industrial placement largely on their own initiative.

Competencies:

Students are able to present practical activities appropriately in both oral and written format, and provide sound reasoning that supports solutions they have developed. They are able to show their ability to reflect on the content of the industrial placement from a scientific perspective. Experiences gained during the industrial placement teach students key competencies, particularly social skills, communication skills and teamwork skills.

Content:

Preparatory course relating to the form and content of the industrial placement:

Students are taught the value of their industrial placement in relation to their studies of theory. They learn the procedure they need to follow in order to find a suitable placement and are aware of application strategies and standards that are expected in HR evaluations.

Potential responses to unusual situations that may arise during the industrial placement are discussed. The required format, structure and content of the placement report are discussed. Students are permitted to attend presentations and talks held by those who have already completed an industrial placement, and clarify their own questions with supervising professors while they are looking for a placement.

Industrial placement:

The actual tasks that students are assigned and the knowledge they learn may differ from one placement to the next. The main objective is that students gain insights into examples of practice, contributing to the objective of their studies. The purpose of this is to highlight the relationship between theory and practice that a Business Informatics degree programme intends to convey. Students have the opportunity to play an active role in planning, analysing, designing, developing, operating and using information systems for business divisions such as marketing, accounting, logistics or production. The supervising professor, together with the supervisor at the training organisation and the Industrial Placements Officer, confirm that the industrial placement has been successfully completed.

Follow-up seminar: presentation and tutorial

Following their industrial placement, students must give a presentation on both the placement and the company in which it was located, and must explain what was involved in their activities and contributions to projects. Following the presentation, certain areas of their work and the areas of knowledge relating to this are discussed in a tutorial format.

Forms of media:

Preparatory course relating to the form and content of the industrial placement:
Content teaching in seminar format, examples of required media presented, workshop-style discussions, one-to-one advisory sessions. Examples of required media discussed.

Industrial placement:

Using own initiative to carry out activities and find solutions to problems assigned to the student by the supervisor. Regular discussions of work progress with the supervisor and – where necessary – assistance from the supervisor. Project documents and descriptions of tasks associated with the placement; task-related sources of information identified through own research.

Follow-up seminar – presentation of industrial placement and tutorial:

Examples of required media discussed. Brief presentation of the company in question, the industrial placement, and the tasks and problems that were undertaken; this information is provided on the central server that all students are able to access.

Literature:

Preparatory course relating to the form and content of the industrial placement:
References to Internet sources.

Industrial placement:

Task-related sources of knowledge that students are expected to research themselves.

Follow-up seminar:

Presentation and tutorial; task-related sources of knowledge that students are expected to research themselves.

Module: Finance and Internal Reporting

Code: 0191

Subtitle: Investment and Financing
Management Accounting

Course elements: Lectures
Lectures

Semester: Every semester

Module coordinator: Prof. Michael Wobbermin

Lecturer: Prof. Thomas Baltzer-Fabarius
Prof. Michael Wobbermin

Language: German

Allocation to the curriculum: Business Informatics (Bachelor's),
compulsory subject, 5th semester

Mode of teaching/semester hours per week (SWS): Lectures 2 SWS
Lectures 2 SWS

Total hours: Contact time 60 hours
Independent study 120 hours

Credits: 6 ECTS

Prerequisites in accordance with examination regulations (StuPro): None

Recommended prerequisites: 0011, 0021

Mode of assessment: Lectures: Written examination

Module objectives:

This module aims to provide students with more advanced knowledge of business administration. It builds on the skills that students have acquired in the Bookkeeping and Accounting module. In addition to skills, this module also equips students with the basic tools they will require to take on management tasks in a company.

Learning outcomes:

Knowledge:

Investment and financing:

- Be able to describe the principles of asset and capital management.
- Be able to explain and implement financial planning.
- Be familiar with information technology applications for asset and capital management.

Management accounting:

- Be familiar with the basics of internal accounting, such as cost category, cost centre and cost unit accounting, as well as cost projection.
- Understand and be able to explain and apply a cost apportionment statement.
- Understand and be able to explain and apply direct costing.
- Be familiar with operational controlling methods on the basis of cost projection.

Skills:

Students are able to contextualise and identify the value of financial management in relation to common business activities. They are able to take a methodological approach to issues that arise in the areas of investment planning, investment budgeting (static and dynamic) and financial planning (long-term and short-term). They have a sound knowledge of how to present internal and external sources of financial information.

They know the principles of absorption costing and direct costing, and are able to apply them in practical scenarios. They are able to create cost projections in the area of operational controlling.

Competencies:

Students possess methodological skills thanks to the application of aspects such as static and dynamic investment budgeting using case studies in small work groups. As a result, they acquire communication skills and the ability to work in a group, which in turn feeds into social skills.

Students are able to apply calculation methods for cost category, cost centre and cost unit accounting, and are able to make strategic suggestions for implementation in the company.

LO#	Learning outcome (LO)	Assessed through
LO1	Demonstrate the skills they have learned in two written examinations	Written examinations
LO2	Assess the problems and limitations that have been addressed in lectures	Written examinations
LO3	Communicate and discuss developments and structuring decisions from a sound scientific standpoint	Written examinations
LO4	Grasp and evaluate current developments in financial management and internal accounting	Written examinations

Content:

Presentation of financial management processes and procedures, as well as the principles and procedures involved in management accounting, on the basis of lectures and case studies. Specifically, the module examines the following subjects:

Investment and financing:

- Principles of asset and capital management.
- Investment planning.
- Investment budgeting.
- Capital requirements and financing sources.
- Financial planning.
- IT applications in asset and capital management.

Management accounting:

- Basic principles.
- Cost category accounting, particularly implicit cost categories.
- Cost centre accounting on the basis of a cost apportionment statement.
- Cost unit accounting on the basis of full and partial costs (direct costing).
- Operational controlling based on cost projections.

Forms of media:

Investment and financing:

Lectures on the basis of dedicated notes. Independent working and brief presentation on individual (specific) subjects, with students required to lead the subsequent group discussion based on case studies they have prepared in advance. Dedicated lecture notes, case study documents, preparation of short presentations.

Management accounting:

Lectures with practical sessions on the basis of dedicated notes.

Literature:

Investment and financing:

- Blohm, Hans; Lüder, Klaus; Schaefer, Christina (2013): Investition. Schwachstellenanalyse des Investitionsbereichs und Investitionsrechnung. 10th edition, edited and updated (online). Munich: Verlag Franz Vahlen.
- Kruschwitz, Lutz (2014): Investitionsrechnung. 14th edition updated. Berlin: De Gruyter Oldenbourg (Internationale Standardlehrbücher der Wirtschafts- und Sozialwissenschaften).
- Perridon, Louis; Steiner, Manfred; Rathgeber, Andreas W. (2014): Finanzwirtschaft der Unternehmung. 16th ed. (online). Munich: Franz Vahlen (EBL-Schweitzer). Available online at <http://swb.ebib.com/patron/FullRecord.aspx?p=1755094>.

Management accounting:

- Deitermann, Manfred; Schmolke, Siegfried; Rückwart, Wolf-Dieter (2014): Industrielles Rechnungswesen IKR. 43rd edition revised. Braunschweig: Winklers (Kaufmännisches Rechnungswesen).
- Wöhe, Günter; Döring, Ulrich (2013): Einführung in die allgemeine Betriebswirtschaftslehre. 25th edition, revised and updated. Munich: Vahlen (Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften).

Module:	Company Modelling	
Code:	0201	
Subtitle:		
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Herbert Glöckle	
Lecturer:	Prof. Herbert Glöckle Prof. Dietmar Bönke	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 5th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	6 SWS
Total hours:	Contact time	90 hours
	Independent study	180 hours
Credits:	9 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Lectures: Written coursework	

Module objectives:

This module aims to teach students methodological approaches to standard software systems and create an integrated picture of the knowledge they have acquired in the modules studied up to this point. It examines a company scenario from a range of perspectives. This process starts by analysing and modelling business processes relating to sales and dispatch, material planning, purchasing and stock management, production planning, controlling, and financial accounting. Using a standard ERP system, students work through this scenario at user level on the basis of an example company. The next step involves the students modelling their own companies, adopting the perspective of a business consultant.

Learning outcomes:

Knowledge:

- Knowledge of a comprehensive methodological approach to introducing standard software systems in companies.
- Understanding of and ability to implement project planning and project management methods.

- Familiarity with and ability to implement technical project design including business process modelling, test case-driven customisation and documentation methodology.
- Ability to adopt a complete overview of integrated company processes.

Skills:

Students learn how to select and use strategic project methods in the context of introducing and using standard software. They are able to design project plans within complex environments and create multifunctional standard software. In doing so, they are able to incorporate areas where various areas of work intersect in order to prevent unoccupied time in the project schedule. This requires productive project work in a team setting. Students carry out a systematic analysis of error situations. Creating documentation relating to the project work within the team as the project is progressing hones cognitive, practical and communication skills that allow knowledge to be applied.

Competencies:

Systematic production of project findings according to a schedule. Handling stressful situations, methods for finding solutions in the complex project environment associated with a comprehensive standard system. Developing solutions for previously unrecognised technical problems within a business, using all the sources available. Teamwork and self-discipline when working with other students.

Content:

Seminar format:

Business process models are derived from various product and production strategies, and described on the basis of a standard method that can be applied in practice. Students develop not only a basis for subsequent processing in the standard ERP system, but also sample navigation models for various logistics situations.

Project work:

Standard software is used to map out various aspects of a model organisation, in the areas of sales and dispatch, material planning, purchasing and stock management, production planning, controlling, and financial accounting.

This is carried out in small sub-projects, familiarising students with the process of organising project groups. Supplementing this process is methodological knowledge in the areas of project management, project processing and test strategies.

Each project group develops its own company model by means of customising. The work is deemed to be successful if the modelled business processes can be carried out using the implemented company model. For this purpose, it is also necessary for the groups to create project documentation that adheres to professional standards.

Forms of media:

Lectures with practical workshop sequences on the subjects of process modelling and processing. Introduction to the use of standard systems through basic scenarios.

Comprehensive project work organised by the students themselves, in groups of 4 to 5, covering the areas of customising, project processing, documentation and test strategies. Students receive lecture notes in electronic format.

Literature:

- Andre Maassen et.al. (2003): Grundkurs SAP R/3, Vieweg Verlag, 2nd edition.
- SAP help system (online library)
- Michael Wobbermin (2000): Arbeitsbuch Buchhaltung, Jahresabschluß, Bilanzanalyse, Schäffer-Poeschel Verlag

Module:	Distributed Systems	
Code:	0211	
Subtitle:		
Course elements:	Lectures Practical sessions	
Semester:	Every semester	
Module coordinator:	Prof. Eckhard Ammann	
Lecturer:	Prof. Eckhard Ammann	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 5th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
	Practical sessions	2 SWS
Total hours:	Contact time	90 hours
	Independent study	150 hours
Credits:	8 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	0081	
Recommended prerequisites:	0031	
Mode of assessment:	Lectures: Written examination Practical sessions: Written coursework	

Module objectives:

Learning outcomes:

Knowledge:

- Understanding of how applications and program components work together in distributed environments.
- Awareness of new issues relating to non-distributed applications. Knowledge of programming and implementation approaches.
- Knowledge of and ability to apply XML technology.
- Ability to understand concepts, models and issues presented by distributed systems.
- Knowledge of how to establish security and protection in IT applications (specifically in distributed systems).
- Knowledge of distributed algorithms.

Skills:

Students are given the ability to evaluate the requirements and features of distributed systems/applications (either existing or new ones) as well as select and apply types of implementation technology in order to adapt existing systems/applications or create new ones. In particular, this involves learning key approaches (programming and otherwise) to implementing distributed applications, and consolidating this knowledge through practical sessions.

Competencies:

The primary aim is for students to develop an understanding of complex application systems in distributed environments, and an ability to design and develop them. In particular, this involves developing formal competencies as well as competencies relating to algorithms, implementation, technology and methodology. This is assessed through written work and a written examination.

Content:

Concepts, models and issues presented by distributed systems and applications are introduced. Programming approaches that can be used to create distributed applications are presented.

The accompanying practical sessions work through basic processes for solving problems relating to distributed applications, and programming tasks relating to this.

The module addresses the following subjects:

- Communication in distributed systems.
- Basic knowledge of XML technology.
- Synchronisation of processes and threads.
- System architectures (client/server, service-oriented, multi-level and peer-to-peer models).
- Security and protection (encryption, authentication and authorisation)
- Naming and directory services.
- Implementation and programming approaches for distributed systems.
- Distributed algorithms.

Forms of media:

Lectures: Presentations and papers.

Practical session on solving programming tasks.

Literature:

- Oechsle, Rainer (2011): Parallele und verteilte Anwendungen in Java. 3rd edition, expanded. Munich: Hanser Verlag (Lehrbücher zur Informatik).
- Schill, Alexander; Springer, Thomas (2012): Verteilte Systeme. Grundlagen und Basistechnologien. 2nd edition, 2012. Berlin, Heidelberg: Springer Berlin Heidelberg (SpringerLink: Bücher).
- Tanenbaum, Andrew S.; Steen, Maarten van (2007): Distributed systems. Principles and paradigms. 2nd ed., [Pearson International Edition]. London: Pearson Prentice Hall.
- G. Coulouris et al. (2012): Verteilte Systeme – Konzepte und Design, 5th ed., Addison-Wesley.
- G. Bengel (2014): Grundkurs Verteilte Systeme, Springer Vieweg.

Module:	Project	
Code:	0221	
Subtitle:	Semester project	
Course elements:	Project	
Semester:	Every semester	
Module coordinator:	Prof. Friedrich Laux	
Lecturer:	All lectures in this specialism	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 5th semester	
Mode of teaching/semester hours per week (SWS):	Project	2 SWS
Total hours:	Contact time	30 hours
	ndependent study	180 hours
Credits:	7 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	None	
Mode of assessment:	Project: Written coursework, presentation	

Module objectives:

Using a concrete task as an example, and aiming to integrate knowledge of business management with informatics technology in order to shape and implement operational information and communication systems, this module requires students to plan and conduct their own project with the aid of scientific and practical methods, structures and content.

Learning outcomes:**Knowledge:**

Students are familiar with scientific and practical methods, structures and content, as well as the associated information systems for designing business processes.

Skills:

Students are able to integrate knowledge of business management with information technology in order to design and implement operational information and communication systems.

Competencies:

Students combine factual information about business administration with the associated IT technology. They are able to solve problems and lead projects using the necessary management skills. They are able to apply the necessary methods and models for analysing, designing and implementing business administration processes in context using information systems. They can use the necessary communication methods and cooperation opportunities to reach and implement decisions.

Content:

Project work, using a concrete task as an example and aiming to integrate knowledge of business management with informatics technology in order to design and implement operational information and communication systems.

During the course of the project, students work through all the stages of a typical software project. Teams consisting of 3 to 5 students must analyse and model an actual task relating to business management. This requires them to design a business management and IT-related concept in order to find a solution for the task. They must then implement this concept in an appropriate IT solution. During the project, they must apply the knowledge of project management they have already gained. The project findings and experiences must be presented and defended in the form of a final presentation in front of a wider audience. The project findings must be recorded in the form of complete project documentation.

Forms of media:

Group work conducted either independently by the students or with a lecturer supervising, plus individual student work based on the tasks (case studies and programming), lecture notes, books, web resources, moderation material.

Literature:

Depends on the task concerned.

General literature relating to methodology: project management, design languages and modelling languages.

Module:	Management and Controlling	
Code:	0231	
Subtitle:		
Course elements:	Lectures	
Semester:	Every semester	
Module coordinator:	Prof. Armin Roth	
Lecturer:	Prof. Armin Roth	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 6th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS
Total hours:	Contact time	60 hours
	Independent study	120 hours
Credits:	6 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	0021, 0041.0051, 0061, 0101, 0191	
Mode of assessment:	Lectures: Written report, presentation	

Module objectives:

This module presents and discusses the entire management process. It examines the lifecycle of a company from a managerial perspective, from the initial idea for the business to selling the company. The aim of the module is to heighten students' awareness of business concerns and teach them about the tasks involved in controlling and management, as well as the methods used to approach this.

Learning outcomes:

Knowledge:

- Be familiar with and able to name the tools, methods and processes used in company management.
- Be able to name and use strategic methods in management and controlling.
- Be familiar with organisational rules.
- Be familiar with the principles of corporate culture.
- Be able to describe change management.
- Be familiar with and able to apply human resources management techniques.
- Be able to describe and explain the basics of management models, management information systems and information management.

- Be aware of and able to use key figure systems and reporting systems for performance measurement in the context concerned.

Skills:

Students have a clearer vision of the entire lifecycle of a company from a management and controlling perspective, from the initial idea for the business to selling the company. Knowledge of processes and tools involved in strategic and operational management is acquired by means of examples. Management models are created, and insights into human resources management foster students' abilities to deploy staff effectively.

Competencies:

Students assess the action parameters involved in management and discuss the various methods that can be used in management from the perspective of how well suited they are to practical application. They are able to reflect on this. Students are able to discuss the subject matter from a practical, managerial perspective and with a specific focus in mind.

LO#	Learning outcome (LO)	Assessed through
LO1	Understand and be able to describe management and controlling processes.	Presentation; case study work, paper
LO2	Be familiar with and able to assess management action parameters.	Presentation; case study work, paper
LO3	Be able to describe and apply various management methods and controlling tools.	Presentation; case study work, paper

Content:

The management process (planning, organisation, staff deployment, leadership and controlling) is used as a basis for considering each of the process steps and the latest tools and methods associated with them. Specifically, the following subject areas are addressed:

- Principles of company management.
- Strategic management and controlling: processes and tools.
- Operational management and controlling: processes and tools.
- Organisation.
- Corporate culture.
- Change management.
- Human resources management.
- Reporting/key figures systems involved in performance measurement.
- Management information systems and information management.
- Leadership/leadership models.

Forms of media:

Lectures, work in small groups, case studies, presentation and written work, simulation game.

Literature:

- Horváth, Péter (2011): Controlling. 12th edition. Munich: Vahlen, Franz (Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften).
- Reichmann, Thomas (2001): Controlling mit Kennzahlen und Managementberichten. Grundlagen einer systemgestützten Controlling-Konzeption. 6th edition, revised and expanded. Munich: Vahlen (Controlling).

- Roth, Armin (1997): Organisation und Steuerung dezentraler Unternehmenseinheiten. Konzepte - Instrumente - Erfahrungsberichte; mit Fallbeisp. Wiesbaden: Gabler.
- Roth, Armin (2014): Ganzheitliches Performance-Management. Unternehmenserfolg durch Perspektivenintegration in ein Management-Cockpit. 1st edition. Freiburg im Breisgau, Munich: Haufe-Grupp
- Schweitzer, Marcell; Küpper, Hans-Ulrich (2011): Systeme der Kosten- und Erlösrechnung. 10th edition, revised and expanded. Munich: Vahlen (Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften).
- Staehle, Wolfgang H.; Conrad, Peter; Sydow, Jörg (2013): Management. Eine verhaltenswissenschaftliche Perspektive. 9th edition. Munich: Vahlen Franz (Vahlens Handbücher der Wirtschafts- und Sozialwissenschaften).
- Steinmann, Horst; Schreyögg, Georg; Koch, Jochen (2013): Management. Grundlagen der Unternehmensführung; Konzepte - Funktionen - Fallstudien. 7nd edition, fully revised. Wiesbaden: Springer Gabler (Springer Gabler Lehrbuch).
- Weber, Jürgen; Schäffer, Utz (2014): Einführung in das Controlling. 14th edition, revised and updated. Stuttgart: Schäffer-Poeschel.
- Case study-related literature.

Module:	Electives 1 and Electives 2	
Code:	wiB62 wiB63	
Subtitle:		
Course elements:	Lectures 2 electives must be completed	
Semester:	Every semester	
Module coordinator:	Prof. Friedrich Laux	
Lecturer:	Depends on elective	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), mandatory electives, 6th semester	
Mode of teaching/semester hours per week (SWS):	Lectures	4 SWS each
Total hours:	Contact time	60 hours
	Independent study	120 hours
Credits:	6 ECTS each	
Prerequisites in accordance with examination regulations (StuPro):	None	
Recommended prerequisites:	0171	
Mode of assessment:	Lectures: Written coursework, presentation	

Module objectives:

Electives enable students to consolidate their knowledge in their own particular areas of interest and supplement it by studying specialist subjects. They primarily involve working on subject areas using scientific methods, taking a research-based learning approach. Electives also cover subject areas that are classified as soft skills or innovative subjects that are highly vocational in nature. These do not have equal weighting for all students, which is why they are included in the elective options.

Learning outcomes:

Knowledge:

Consolidate specialist knowledge of selected subject areas.

Skills:

Students consolidate their knowledge of specialist scientific subjects of their choice, drawn from the area of business informatics.

Competencies:

Using the methodological skills they have acquired, students are able to analyse specifically scientific subject areas in their field of specialism and explain them using supporting arguments.

Content:

Taking the form of research-based learning, electives involve more input from visiting lecturers from science and practice and allow students to choose from a wide range of subjects, all of which relate directly to business informatics or to aspects of professional IT practice.

Examples of these subjects include:

- Starting up a business.
- SAP BW basic course.
- ARIS/ViFlow business modelling.
- Non-standard databases.
- ABAP and SAP tools.
- Introduction to database administration.
- Current themes in marketing research and practice.
- Operation research.

Forms of media:

Teaching sessions in a seminar format, adopting a project-focused approach that enables research-based learning.

Literature:

Subject-specific.

Module:	Bachelor's Thesis	
Code:	wiB65	
Subtitle:		
Course elements:	Thesis	
Semester:	Every semester	
Module coordinator:	Prof. Friedrich Laux	
Lecturer:	All	
Language:	German	
Allocation to the curriculum:	Business Informatics (Bachelor's), compulsory subject, 6th semester	
Mode of teaching/semester hours per week (SWS):	Thesis	2 SWS
Total hours:	Independent study	360 hours
Credits:	12 ECTS	
Prerequisites in accordance with examination regulations (StuPro):	At least 140 credits	
Recommended prerequisites:	All lectures in the Business Informatics Bachelor's degree	
Mode of assessment:	Bachelor's thesis, oral examination	

Module objectives:

The Bachelor's thesis represents the final piece of examined work and is designed to prove that students are able to produce a comprehensive, interdisciplinary business informatics assignment independently, within a certain time frame and on the basis of fundamental scientific methods. It contributes to the overall learning objectives in a Business Informatics degree.

Wide-ranging interdisciplinary specialist knowledge and extensive methodological skills: a Bachelor's thesis requires students to apply knowledge and develop excellent methodological skills in a range of disciplines. This covers informatics-related, software-related, media-related, psychological, didactic and business-related aspects, as well as others besides.

Attractive career prospects: Bachelor's theses deal with problems that will be relevant to business practice in informatics-related fields in the future. A Bachelor's thesis can be written as an external piece of work in conjunction with a company.

International perspective: Bachelor's theses may be written in English. They may also be completed in conjunction with institutions in other countries.

The Bachelor's thesis serves as a strong indication of the student's suitability for moving on to further studies, especially where this concerns a Master's degree programme at the same or a different university.

Learning outcomes:

Competencies:

The Bachelor's thesis shows that students are able to produce a business informatics assignment independently, within a certain time frame and on the basis of fundamental scientific methods.

Students demonstrate their ability to work on a specific subject area independently, using scientific methods, and their mastery of fundamental techniques involved in producing a scientific paper, such as structure, citations and adhering to an external format.

After completing a Bachelor's thesis, students will be able to develop solutions to business informatics-related tasks on their own initiative. This also indicates that they have developed the skills to scrutinise problems and tasks on an interdisciplinary level, and translate this thinking into an integrated, cross-disciplinary solution.

Content:

Bachelor's thesis subjects relate to business informatics scenarios that are trending topics within the discipline and are likely to remain so in the foreseeable future. They cover a whole range of informatics-related, software-related, media-related, psychological, didactic and scientific aspects – as well as others besides – that exist in complex relationships with the solutions found in the scenarios concerned.

It is not possible to issue a topic for a thesis until the student has earned at least 150 credits. The volume of work should be enough to span 3 months. The thesis must be submitted no later than 6 months after the topic has been issued.

Forms of media:

Specialist and methodological supervision of the Bachelor's thesis by means of advice and support sessions. If the thesis is being written in conjunction with a company, these sessions also take place at the company's premises.

Students will also be required to research and reference relevant information, and – where necessary – show how it is relevant to a business environment and achieves the goal in question.

Literature:

Subject-specific documents.