

# **Module Handbook**

## **Programme**

Business Informatics

(Bachelor)

## **Faculty**

Applied Economics (School of Management)

Deggendorf Institute of Technology

## **Preliminary Remark**

The modules are offered in the regular programme as well as in the extra-occupational / part-time programme.

In the extra-occupational version, approximately 40% of the programme is substituted with virtual courses which are imported from either tailor-made courses or the Virtual University of Bavaria (VHB). The content of both variations (regular and extra-occupational) are almost identical and there will only be an explicit module description for both when the two vary.

The instructors are also identical in about 80% of courses, and this will not be indicated. In terms of the workload, the different workload for the extra-occupational programme (as a result of the higher number of virtual course components) will be explicitly indicated. Here, the data will contain the add-on, "(bb)".

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## Module E-01 Formal Languages, Data Structures and Algorithms

<b>Module name</b>	Formal Languages, Data Structures and Algorithms
<b>Module no.</b>	E-01
<b>Module head</b>	Prof. Dr. Georg Herde
<b>Major field</b>	-
<b>Course number and course name</b>	E1101 Formal Languages, Data Structures and Algorithms
<b>Instructors</b>	Prof. Dr. Georg Herde
<b>Semester</b>	1
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	5.0
<b>Workload</b>	Class Time: 60 hours, 35 hours (bb) Virtual Teaching: 0 hours, 31 hours (bb) Independent Study: 90 Hours, 84 hours (bb)
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	Seminar-style Lecture
<b>Further information</b>	Part of the course will be available virtually.
<b>Type of examination</b>	Written exam 90 min

### Learning objectives

The module should familiarise students with the basic concepts of informatics. Upon completion of the module, students should be able to recognise and utilise the principles of informatics in modern software applications and to interpret them correctly in this context. This skill should be independent of the application software used.

### Content

1. Clarification of Terms and Concepts
  - 1.1 Science
  - 1.2 Technical Language
  - 1.3 Informatics
  - 1.4 System / Model
  - 1.5 Information
2. Introduction to Algorithms and Computability
  - 2.1 Properties of Algorithms
  - 2.2 Complexity of Algorithms
  - 2.3 Computability
3. Introduction to Automata Theory
  - 3.1 Deterministic Finite Automaton
  - 3.2 Graphic Notation
  - 3.3 Finite-state Machine as a Tuple

4. Turing Machine
  - 4.1 Explanation of the Mathematical Model
5. Operational Machine Model
  - 5.1 Three Address Code
  - 5.2 Value Assignment
  - 5.3 Direct, Indirect and Indexed Addressing
6. Functions of a Compiler
  - 6.1 Lexical Analysis
  - 6.2 Syntactic Analysis
  - 6.3 Semantic Analysis
7. Introduction to Programming Languages
  - 7.1 Language Features (Syntax, Semantics, Pragmatics)
  - 7.2 Metalanguages: Backus-Naur-Form (BNF), Syntax Diagrammes
  - 7.3 Grammars (Chomsky Hierarchy)
  - 7.4 Introduction to the Semantics of Programming Languages
8. Path to Imperative Programming Languages
  - 8.1 Structured Programming: Programme Flowcharts, Stuctograms (Nassi-Schneiderman Diagram), Pseudocode
  - 8.2 Imperative Programming Languages: Data Types, Data Structures, Algorithms
9. Identifying some of these Basic Principles in Modern Application Systems
10. Introduction to Office Applications
  - 10.1 Word Processor
  - 10.2 Spreadsheet
  - 10.3 Personal Information Manager
11. Recognition of Basic Principles in Software Applications
  - 11.1 Use of Meta Language
  - 11.2 Syntax of Commands and Macro-applications
  - 11.3 Data Types and Data Structures in Spreadsheets and Data Banks
  - 11.4 Algorithms for Mail Merge
  - 11.5 Addressing in Spreadsheets and Word Processing Programmes

### **Recommended literature**

Kowalk, W. P.: System, Modell, Programm, Spektrum Akademischer Verlag, Heidelberg Berlin Oxford, 1996

Richter, R. / Sander, P. / Stucky, W.: Problem – Algorithmus - Programm, B. G. Teubner Verlag, Stuttgart Leipzig Wiesbaden, 2. Auflage, 1999

Herold, H. / Lurz, B. / Wohlrab, J.: Grundlagen der Informatik, Pearson Studium, München, 2007

Pomberger, G. / Dobler, H.: Algorithmen und Datenstrukturen, Pearson Studium, München, 2008

Wirth, Niklaus: Algorithmen und Datenstrukturen, B. G. Teubner, Stuttgart Leipzig Wiesbaden, 5. Auflage, 1998

Eirund, H. / Müller, B. / Schreiber, G.: Formale Beschreibungsverfahren der Informatik, B. G. Teubner, Stuttgart Leipzig Wiesbaden, 1. Auflage, 2000

Appelrath, H.-J. / Boles, D. / Claus, V. / Wegener, I.: Starthilfe Informatik, B. G. Teubner, Stuttgart Leipzig Wiesbaden, 1998

## Module E-02 Principles of Business Administration

<b>Module name</b>	Principles of Business Administration
<b>Module no.</b>	E-02
<b>Module head</b>	Prof. Dr. Michael Ponader
<b>Major field</b>	-
<b>Course number and course name</b>	E1102 Decision Theory and the Business Plan Game E1105 Accounting
<b>Instructors</b>	Prof. Dr. Michael Ponader Prof. Dr. Konrad Schindlbeck Prof. Dr. Georg Herde
<b>Semester</b>	1
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class Time: 75 hours, 36 hours (bb) Virtual Teaching: 0 hours, 36 hours (bb) Independent Study: 105 Hours, 33 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	Seminar-style lesson, Exercises
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

Students become familiar with the role of accounting and are able to perform bookkeeping for important business transactions on the basis of the industry account system. They are familiar with the statement and valuation provisions of the HGB (German Commercial Code), the effect of the German Accountancy Law Modernisation Act (BilMoG) on annual financial statements and can apply this knowledge in simple valuation cases. They have command of the key aspects of management accounting (the compilation, estimation and allocation of costs). Students are able to carry out an internal cost allocation and a cost-centre oriented profitability check based on cost accounting principles. They can carry out an estimate as well as a short-term profit and loss account.

The students are familiar with and understand the basic principles and methods of systematic decision making. They have gained an overview of the operational

functional areas of a business and their interconnectedness. Topics and issues in Business Administration will be compiled in teams and will then be prepared for class presentations.

## **E1102 Decision Theory and the Business Plan Game**

### **Content**

1. Decision Theory
  - 1.1 Overview of concepts of decision theory
  - 1.2 Detailed examination of normative decision theory: elements of the decision model; premises; types and applicability of decision rules
  - 1.3 Critical discussion of normative decision theory
  - 1.4 Practical application using case examples
2. Business Plan Game
  - 2.1 Overview of the essential tasks of functional areas in business and the interdependence of decisions in these different areas through a business plan game
  - 2.2 Examination of selected business administration models: goal setting, premises, core statements, applicability and limitations

### **Recommended literature**

1. Alisch, K. u.a. (Hrsg.), Gabler-Wirtschaftslexikon, 16. Auflage, Gabler, Wiesbaden, 2005
2. Dörsam, P., Grundlagen der Entscheidungstheorie anschaulich dargestellt, 5. Auflage, PD-Verlag, Heidenau, 2007
3. Meffert, H., Marketing, 10. Auflage, Gabler, Wiesbaden, 2008
4. Mertens, P., Bodendorf, F., Programmierte Einführung in die Betriebswirtschaftslehre, 12. Auflage, Gabler, Wiesbaden, 2005
5. Wöhe, G., Einführung in die allgemeine Betriebswirtschaftslehre, 23. Auflage, Vahlen, München, 2008

### **Type of examination**

Written exam, 90 min.

## **E1105 Accounting**

### **Content**

1. Introduction to Accounting
  - 1.1 Concepts and terms

- 1.2 Tasks and areas of accounting
2. Bookkeeping and records provisions
3. Inventory, physical inventory and balance sheets
4. Double-entry Bookkeeping System
5. Generally Accepted Accounting Principles (GAAP)
6. Goods Accounts
7. Financial Sector
8. Annual Financial Statement
9. Key Concepts of Managerial Accounting
10. Cost Accounting
11. Cost Centre Accounting
  - 11.1 Internal cost allocation
  - 11.2 Profitability Control
12. Cost Unit Accounting
  - 12.1 Cost-plus pricing
  - 12.2 Calculation of machine rates
13. Marginal and Direct Cost Calculation
  - 13.1 Direct costing
  - 13.2 Multi-stage margin accounting
14. Short-term Profit and Loss Accounting (Income Statement)
  - 14.1 Total cost method
  - 14.2 Cost of sales method
15. Planned Cost Accounting
  - 15.1 Flexible planned cost accounting
  - 15.2 Deviation analysis
16. Activity Based Costing

### **Recommended literature**

Blödtner, W., Bilke, K., Heining, R., Lehrbuch Buchführung und Bilanzsteuerrecht, 9. Aufl., NWB-Verlag, Herne/Berlin, 2009

Heinhold, M., Buchführung in Fallbeispielen, 10. Auflage, Schäffer-Poeschel Verlag, Stuttgart, 2006

Däumler K.-D., Grabe, J., Kostenrechnung 1, Grundlagen, 10. Aufl., NWB-Verlag, Herne/Berlin, 2008

Däumler, K.-D., Grabe, J., Kostenrechnung 2, Deckungsbeitragsrechnung, Aufl., NWB-Verlag, Herne/Berlin, 2006

Däumler, K.-D., Grabe, J., Kostenrechnung 3 , Plankostenrechnung, Aufl., NWB-Verlag, Herne/Berlin, 2004

Heinhold, M., Kosten- und Erfolgsrechnung in Fallbeispielen, 3. Auflage, Lucius & Lucius UTB, Stuttgart, 2007

### **Type of examination**

Written exam, 90 min



## Module E-03 Fundamentals of Mathematics

<b>Module name</b>	Fundamentals of Mathematics
<b>Module no.</b>	E-03
<b>Module head</b>	Prof. Dr. Heribert Popp
<b>Major field</b>	-
<b>Course number and course name</b>	E1103 Principles of Mathematics
<b>Instructors</b>	Prof. Dr. Heribert Popp Prof. Dr. Johannes Grabmeier
<b>Semester</b>	1
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	9.0
<b>Workload</b>	Class Time: 90 hours, 35 hours (bb) Virtual Teaching: 0 hours, 49 hours (bb) Independent Study: 180 Hours, 96 hours (bb) Total: 270 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Knowledge of Abitur (high school)—level mathematics is recommended
<b>Teaching and learning methods</b>	Knowledge of Abitur (high school)—level mathematics is recommended
<b>Further information</b>	In Mathematics, there is a 25% online portion
<b>Type of examination</b>	Written exam 90 min

### Learning objectives

The students will gain the mathematical basis from the areas of analysis, linear algebra and financial mathematics required for the management of information systems. Furthermore, an overview of the mathematical thinking and working methods of business informatics will be gained through real examples from business practice.

The student will gain technical and mathematical competence so that he or she can formally describe problems.

The students will be able draw on their mathematical knowledge in order to successfully solve formal problems

The students are in a position to employ the appropriate mathematical tools such as a computer algebra system or a spreadsheet programme to solve problems and complete tasks

### Content

1. Basic Mathematical Concepts
  - 1.1 Logic
  - 1.2 Set theory
  - 1.3 Relation
  - 1.4 Function
  - 1.5 Number systems
  - 1.6 Sequences and Series
2. Linear and Non-linear Functions, their Properties and their Economic Applications
3. Differentiation and its Economic Application (differentiation rules, higher derivatives, curves sketching)
4. Fundamentals of Integral Calculus
  - 4.1 the Riemann Integral
  - 4.2 Rules of integration
5. Differential Calculation of Functions with Multiple Independent Variables and its Economic Applications
  - 5.1 Linear and non-linear functions with multiple independent variables and their economic applications
  - 5.2 Partial derivatives
  - 5.3 Hessian Matrix and
  - 5.4 Determining the Extrema
6. Linear Algebra and Matrix Calculations
  - 6.1 Vector spaces, linear equations
  - 6.2 Linear maps and invertible matrices
  - 6.3 Gaussian elimination for solving linear equations
  - 6.4 Determinants
7. Financial Mathematics
  - 7.1 Linear interest
  - 7.2 Compound interest and continuous compounding interest
  - 7.3 Depreciation
  - 7.4 Repayment and Installment calculations
  - 7.5 Investment Appraisal

### **Recommended literature**

Pfuff, Franz, Mathematik für Wirtschaftswissenschaftler kompakt , 3. Aufl., Vieweg+Teubner Verlag, Braunschweig, 2009

Pfuff, Franz, Mathematik für Wirtschaftswissenschaftler 2, 1. Aufl., Vieweg Verlag, Braunschweig, 1979

Holland, Heinrich, Holland, Doris, Mathematik im Betrieb, 7. Aufl., Gabler Verlag, Wiesbaden, 2004

Auer, Benjamin, Seitz, Franz, Grundkurs Wirtschaftsmathematik. 2. Aufl. Gabler, Wiesbaden, 2009

Bauer, Ch., Clausen, M., Kerber, A., Meier-Reinhold, H., Mathematik für Wirtschaftswissenschaftler, Schäffer-Poeschel, 5. überarbeitete Aufl., 2008

Jenks, R. D., Sutor, R. S., AXIOM -- The Scientific Computation System, Springer Verlag, Heidelberg, 1992

Bradley, Teresa, Patton, Paul, Essential Mathematics for Economics and Business, John Wiley & Sons, 1998

Ohse, Dietrich, Mathematik für Wirtschaftswissenschaftler II, Lineare Wirtschafts- algebra, 4. Aufl. Verlag Vahlen, 2000

Pfeifer, Andreas, Praktische Finanzmathematik, Verlag Harri Deutsch, Frankfurt a. Main, 2009

Tietze, Jürgen, Einführung in die Finanzmathematik, Vieweg Verlag, Wiesbaden, 2009

### Module E-04 Multimedia and Internet

<b>Module name</b>	Multimedia and Internet
<b>Module no.</b>	E-04
<b>Module head</b>	Prof. Dr. Heribert Popp
<b>Major field</b>	-
<b>Course number and course name</b>	E11043 Multimedia and Internet
<b>Instructors</b>	Prof. Dr. Heribert Popp Prof. Dr. Michael Ponader Prof. Dr. Andreas Kohl Alexander Nacke
<b>Semester</b>	1
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	5.0
<b>Workload</b>	Class Time: 60 hours, 14 hours (bb) Virtual Teaching: 0 hours, 42 hours (bb) Independent Study: 90 Hours, 94 hours (bb) Total: 150 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	No admission requirements, just high school-level knowledge.  Students receive lists of which sections they should review online before each lecture.
<b>Teaching and learning methods</b>	Lectures; tutorials to accompany the lectures; collaborative learning with E-Learning. Assigned group project: Designing a homepage incl. homepage contest with presentation
<b>Further information</b>	In Mathematics, there is a 25% online portion
<b>Type of examination</b>	Exam and Assignment (homepage and usability project)

## Learning objectives

The student will require the basic knowledge of tools and software required for the creation of web applications. Furthermore, they will gain an overview of the multimedia-based thinking and working methods of business informatics. The students are able to apply their knowledge of multimedia to develop successful web application solutions. They are familiar with and understand internet tasks in terms of small WWW projects as well as the possibilities and limitations of common internet development technologies.

## Content

### Popp Section:

1. Definitions of multimedia, virtual reality and new media
2. Dreamweaver CS3
3. Programming in HTML 4
4. Animation with Flash
5. Introduction to programming in XML
6. Introduction to programming in JavaScript
7. Description of the tasks involved in the development, implementation and operation of small WWW applications from the perspective of a project manager
8. Overview of internet development technologies and criteria for the selection of development technologies, description of the possibilities and limitations of common technologies, developing awareness for conflicts with regard to the criteria in the selection of technologies
9. Web Usability - general principles in the design of user interfaces, introduction to the design principles for the navigation and layout of user interfaces in the WWW
10. Overview of multimedia technologies such as the digitalization of images, audio and videos
11. Creating homepages with tools and programming, generating animations
12. Multimedia hardware and hardware and software for the mobile internet

### Ponader Section:

1. Internet and WWW
  - 1.1 Origin and technological foundation
  - 1.2 Browser
  - 1.3 Security on the internet
2. Overview of internet development technologies
  - 2.1 Criteria for the selection of development technologies
  - 2.2 Client technologies
  - 2.3 Server technologies
3. Description of the tasks involved in the development, implementation and operation of small WWW applications from the perspective of a project manager
  - 3.1 Putting together a project team
  - 3.2 Internet access
  - 3.3 Registering a domain name
  - 3.4 Selecting SW / HW
  - 3.5 Selecting a provider (WWW-server)
  - 3.6 Selecting an implementation partner

- 3.7 Creating a website
- 3.8 Rules for the maintenance and updating
- 3.9 Marketing

### Recommended literature

Henning, Peter A., Taschenbuch Multimedia , Fachbuchverlag Leipzig im Carl-Hanser-Verlag, München, 2001

Beer, Richard, Gailus, Susann, Adobe Dreamweaver CS3, Galileo Design, 2008  
Gräning, Tobias, Einstieg in Adobe Flash CS3, Galileo Design, Bonn, 2008

Alpar, P., Kommerzielle Nutzung des Internet, 2. Auflage, Springer, Berlin u.a., 1998

Bundesverband digitale Wirtschaft (BVDW) e.V. (Hrsg.), Leitfaden - Marketing, BVDW, Düsseldorf, 2006

Chaffey, D., Mayer, R., Johnston, K., Ellis-Chadwick, F., Internet-Marketing, 2. Auflage, Prentice Hall/Financial Times, Harlow u.a., 2009

E-Consultancy (Hrsg.), A Best Practice Guide to Effective Web Design, o.O, 2007  
Page 17

E-Consultancy (Hrsg.), Online Retail 2006 - User Experience Benchmarks, o.O, 2006

El Moussaoui, H., Zeppenfeld, K., AJAX - Geschichte, Technologie, Zukunft, 1. Auflage, Springer, Berlin u.a., 2008

Münz, S., Self-HTML, [www.selfhtml.org](http://www.selfhtml.org)

Wilsonford Associates (Hrsg.), The 10 Commandments of web project planning, East Sussex, 2004

### Module E-05 Specific Business Administration

<b>Module name</b>	Specific Business Administration
<b>Module no.</b>	E-05
<b>Module head</b>	Prof. Dr. Michael Ponader
<b>Major field</b>	-
<b>Course number and course name</b>	E2102 Marketing and Human Resources E3104 Materials and Production Management, Finance and Investment
<b>Instructors</b>	Prof. Dr. Hans Paul Bisani Prof. Dr. Herbert Fischer Prof. Dr. Michael Ponader Prof. Dr. Reinhold Markmiller
<b>Semester</b>	2 & 3

<b>Length of module</b>	2 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	8.0
<b>ECTS</b>	9.0
<b>Workload</b>	Class Time: 120 hours, 49 hours (bb) Virtual Teaching: 0 hours, 63 hours (bb) Independent Study: 150 Hours, 158 hours (bb) Total: 270 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

The students become familiar with the basic principles and the significance of marketing and gain an understanding of the possible applications of motivation and behavioural research models to explain customer behaviour. They become familiar with both branding tools and its objectives as well as the tools of promotion (marketing) and can apply them in practice. The students develop the ability to apply important knowledge from the fields of psychology and group dynamics to solve issues in practice at the executive / management level. They gain the theoretical basis necessary to critically reflect on their own experiences with group dynamics (through the block course, Outdoor Team Building) and develop an understanding of personell management as an interdisciplinary field and of important personell strategy functions in a company.

The students gain an overview of sociological frames of reference as well as important management theories and models. They develop the competence to reflect on and shape the role of management in a company and learn the functions and processes of materials and production management in theory and practice. They can perform demand, stock and order quantity calculations in order to solve simple logistics problems.

Furthermore, the students gain a basic knowledge of the relevant principles of business financing and the interrelationships between financial decisions as well as a knowledge of the field of capital budgeting and investments. They understand the interplay between financing and investment decisions and can evaluate various types of financing. They are able to carry out simple cost-benefit analyses for investing and financing projects, and are able to make financial decisions based on the results.

### E2102 Marketing and Human Resources

## **Content**

### **Marketing**

1. Basic principles of customer behaviour as a basis for market-oriented action: Behaviour is both needs-oriented and motive-driven. This knowledge from motivation and behavioural research has a strong influence in the particular areas of the marketing mix (price, product, promotion, place). The specific fields of motivation theory and their respective key theses will be addressed using consumer goods as examples.
2. Basic principles of the branding process: this section will shed light on the possibilities companies have to generate a competitive advantage within a saturated market with homogenous and generic products. In particular, brand awareness, brand joining and brand loyalty will be addressed.
3. Basic principles of advertising and communication: this section will address the important approaches available to a company to communicate successfully and efficiently with consumers based on their developed products. This includes the development of an advertising campaign as well its implementation in specific types of media.

### **Human Resources**

1. Introduction, definition and delimitation of terms, challenges in practice, significance and effects of performance, motivation and behaviour
2. Relevant sociological and socio-psychological concepts and their application in business management, groups and teams in organisations, structures and processes in groups and team development, group work in organizations
3. Development of management research, property theory of management, management styles, situation theories, organizational culture and symbolic management, systematic management, application of theories in consulting and training
4. The intersection of HR and management tasks: finding and selecting staff, management by objectives, motivating employees, conducting employee appraisals, establishing feedback systems, employee development, managing changes

### **Recommended literature**

Boltz, D.-M., Leven, W., Effizienz in der Markenführung, 1. Auflage, Gruner und Jahr, Hamburg, 2004

Boltz, D.-M., Leven, W., Effizienz in der Markenführung, 1. Auflage, Gruner und Jahr, Hamburg, 2004

Urban, D., Die Kampagne, Werbepaxis in 11 Konzeptionsstufen, 1. Auflage, Schäffer- Poeschel, Stuttgart, 1997

Kracke, B., Crossmedia-Strategien, Dialog über alle Medien, 1. Auflage, Gabler-Verlag, Wiesbaden, 2001

Kroeber-Riel, W., Bildkommunikation, Imagerystrategien für die Werbung, 2. Auflage, Vahlen-Verlag, München, 1996

Winkelmann, P., Marketing und Vertrieb, Fundamente für die marktorientierte Unternehmensführung, 6. Auflage, Oldenbourg-Verlag, München u.a., 2008

Buchanan, D., Huczynski, A., Organizational Behaviour, London, 6th ed., 2006

Bartscher, T., Huber, A., Praktische Personalwirtschaft, Wiesbaden, 2., vollst. überarb. Auflage 2007

Bartscher, T., Waldmann, R., vhb-Modul, Einführung in das Human Resource Management, 2007

Gaugler, E. et al. (Hrsg.), Handwörterbuch des Personalwesens, Stuttgart 2004

Kälin, F., Müri, P., Sich und andere führen, 15. Aufl. Thun, 2005

Neuberger, O., Führen und führen lassen, 6. Aufl., Stuttgart, 2002

Robbins, S. P., Organizational Behaviour, 11th edition, New Jersey, 2005

Rosenstiel, L.v., Regnet, E., Domsch, M.: Führung von Mitarbeitern, 5. Aufl., Stuttgart, 2003

Rosenstiel, L. v., et al. (Hrsg.), Handbuch für erfolgreiches Personalmanagement, Stuttgart 2003

Steiger, T., Lippmann, E., Handbuch angewandte Psychologie für Führungskräfte, Band 1, Berlin, 3. Aufl. 2008

Schulz von Thun, F., Miteinander reden, Band 1: Störungen und Klärungen. Reinbek 45. Aufl. 2006

Ulrich, D., The Future of Human Resource Management, San Francisco 2005  
Weisbach, C. R., Professionelle Gesprächsführung, 7. Aufl., München, 2008

### **Teaching and learning methods**

Seminar-style lesson with moderated discussion

Block course, Outdoor Teambuilding: Theoretical approaches to the subject of groups and teams will be made more tangible with the help of interactive exercises and problem solving tasks.

Virtual teaching based on the module from the VHB: Introduction to Human Resource Management (Bartscher / Waldmann)

### **Type of examination**

Written exam, 90 min.



## **E3104 Materials and Production Management, Finance and Investment**

### **Content**

#### **Materials and Production Management Part:**

1. Materials Management
  - 1.1 Definitions and delineation of concepts, tasks of materials management
  - 1.2 Structural organization and process organization
2. Disposition
  - 2.1 Materials disposition (basic principles)
3. Demand Calculation
4. Dispo-Material Calculation of Requirements (programme-controlled)
5. Dispo-Material Calculation of Requirements (consumption-controlled)
6. Stock Calculation
  - 6.1 Dispo-stock calculation (basic principles)
  - 6.2 Dispo-stock calculation (order-controlled)
  - 6.3 Dispo-stock calculation (plan-controlled)
  - 6.4 Dispo-stock calculation (consumption-controlled)
7. Order Quantity Calculation
  - 7.1 Dispo-order quantity calculation (basic principles)
  - 7.2 Dispo-order quantity calculation
8. Procurement
9. Stock
  - 9.1 Materials management
  - 9.2 Materials analysis

#### **Finance and Investment Part:**

1. Overview of financial key concepts, goals, and instruments
2. Liquidity, capital requirements, financial balance, organization of corporate finance, transactions, instruments of financial management (financial ratios, finance plan, financial controls).
3. Knowledge of capital forms and sources
4. Financing types, financially relevant markets, financing substitutes, credit security
5. Overview of possibilities and limitations of financial management taking into consideration various time horizons
6. Fundamentals of financial planning, balance sheet analysis, financial analysis, financing rules, new developments in finance, corporate financial policies
7. Knowledge of the basic principles of investment as well as the most important methods of investment appraisal

### **Recommended literature**

#### **Materials and Production Management Part:**

Ebel, Produktionswirtschaft, Kiehl, 9.Auflage, 2009

Ehrmann, Logistik, Kiehl, 6. Aufgabe, 2008

Händler, Jürgen, Betriebswirtschaftslehre für Ingenieure, Fachbuchverlag Leipzig, 2001

Händler, Jürgen, Materialmanagement, Hanser Verlag München Wien, 1999

Koether, Reinhard, Taschenbuch Logistik, Fachbuchverlag Leipzig, 2004

Oeldorf/Olfert, Materialwirtschaft, Kiehl, 3.Auflage, 2009

Westkämper, Einführung in die Organisation der Logistik, Springer, 1.Auflage, 2006

### **Finance and Investment Part:**

Olfert, Klaus/Reichel, Christopher, Kompakt-Training Investition, Kiehl Verlag, 3. Auflage (oder aktueller), Ludwigshafen 2003

Olfert, Klaus/Reichel, Christopher, Kompakt-Training Finanzierung, Kiehl Verlag, 4. Auflage (oder aktueller, derzeit 6. Aufl.), Ludwigshafen 2004

In addition, self-made learning materials will be used.

### **Admission requirements and recommended prerequisites**

Knowledge of financial accounting as well as mathematical finance from the Mathematics course as well as the module Fundamentals of Business Informatics

### **Teaching and learning methods**

Seminar-style lesson, exercises.

Virtual teaching and learning platform (iLearn)

In addition to knowledge transfer (in particular models, creating checklists, calculation and evaluation methods) students gain the ability to apply various cost-benefit calculations.

### **Type of examination**

Written exam, 90 min

## **Module E-06 Technical English**

<b>Module name</b>	Technical English
<b>Module no.</b>	E-06
<b>Module head</b>	Prof. Dr. Georg Herde
<b>Major field</b>	-

<b>Course number and course name</b>	E2106 Business English E1106 Fundamentals of Business E3103 IT English
<b>Instructors</b>	Prof. Dr. Heribert Popp LK Deborah Lehman-Iri MA Maria Schönauer LK Gerhard Brauch-Widmann Prof. Dr. Andreas Kohl Alexander Nacke
<b>Semester</b>	1, 2 & 3
<b>Length of module</b>	3 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	8.0
<b>Workload</b>	Class Time: 90 hours, 36 hours (bb) Virtual Teaching: 0 hours, 22 hours (bb) Independent Study: 90 Hours, 122 hours (bb) Total: 180 hours
<b>Language of instruction</b>	English
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

The module should enable students to use their subject and career-specific English language skills in an international context and to build on and consolidate their subject-specific terminology from the areas of economics and information technology.

The course has a seminar-style character and is based on a high level of student participation with the clear goal of an improved knowledge of English through the active use of the language.

### E2106 Business English

#### Learning objectives

The students understand longer written and audio texts and are able to summarize their content in both oral and written form. They are able to give presentations on economic topics.

#### Content

1. Negotiations
2. Complaints
3. Banking
4. Comparing Economies (e.g. India/China)
5. Globalization and the Environment
6. Recruitment
7. Case studies, essay writing
8. Revision of conditionals, adverbs
9. Presentations

### **Recommended literature**

Allison, John, Emmerson, Paul, *The Business*, Macmillan/Hueber, London 2008

Cotton, David, Falvey, David, *Market Leader upper-intermediate*, Macmillan, London 2008

Hughes, John: *Success with BEC Vantage*, Sommertown, 2008

Cullen, William; Lehniger, Doris: *B for Business*, Hueber, München 2001

### **Admission requirements and recommended prerequisites**

High school certificate and successful completion of the "Fundamentals of Business English" exam.

### **Teaching and learning methods**

Seminar with group and partner work, presentations, listening comprehension

### **Type of examination**

Written exam, 60 min.

## **E1106 Fundamentals of Business English**

### **Learning objectives**

Students build a foundation in business english terminology and content. They gain the ability to understand longer economic articles and to give presentations (e.g. on the economies of different countries or important companies)

### **Content**

1. Globalization
2. Cross-cultural issues
3. Business organization
4. Company organization
5. Letter writing
6. Revision of verb tenses

### **Recommended literature**

Wood, Ian, Sanderson, Paul, Pass Cambridge Vantage, CUP, Cambridge 2004

Hughes, John, Success with BEC Vantage, Sommertown, 2008

Cullen, William; Lehniger, Doris, B for Business, Hueber, München 2001

### **Admission requirements and recommended prerequisites**

High school certificate

### **Teaching and learning methods**

Seminar with group and partner work, presentations, listening comprehension

### **Type of examination**

Written exam

## **E3103 IT English**

### **Content**

1. Development of basic English language skills in the context of business and information technology
2. Increasing familiarity with important areas of business and information technology-specific vocabulary
3. Introduction to common English and American idioms to improve comprehension skills
4. Reading business and information technology texts (business and economic reports)
5. Reading comprehension, evaluation of information and translation into the German language
6. Proficiency in drafting business letters and software documentation
7. Conducting typical day-to-day business correspondence in various departments; acquisition of standard international terminology (Incoterms)
8. Gain the ability to communicate effectively in business situations in written and oral form in English
9. Gain the ability to correctly understand and interpret reports on the business situation and perspectives of a company and statements on economic development.
10. Give a speech on a self-selected topic from the field of information technology in English
11. Address questions and theories on the selected topic and discuss these questions and theories with the audience.

### **Recommended literature**

Irlbeck, Th., Computer-Englisch, Deutscher Taschenbuch Verlag, Beck EDV-Berater A-Z, 3. Auflage, München 1998

Editor Wehmeier, S., Oxford Advanced Learner's Dictionary of Current English, Oxford University Press u. a., Oxford, 2003

Editor The British Computer Society Schools Expert Panel Glossary Working Party, The BCS Glossary of ICT and Computing Terms, Pearson Prentice Hall, Essex Eng- land, 1005

Pfaffenberger, Bryan, Webster's New World - Dictionary of Computer Terms, 8th Edition, Foster City, 2000

Editorial Team, Collins Cobuild - Dictionary of IDIOMS, Harper Collins Publishers, 1999

Newsweek Journal - <http://www.newsweek.com/> TIME Magazine - <http://www.time.com/time/>

### Teaching and learning methods

Seminar

### Type of examination

Written assignment; student work; written exam, 90 min.

## Module E-07 Software Development

<b>Module name</b>	Software Development
<b>Module no.</b>	E-07
<b>Module head</b>	Prof. Dr. Herbert Fischer
<b>Major field</b>	-
<b>Course number and course name</b>	E2104 Software Engineering E1107 Principles of Software Development
<b>Instructors</b>	Prof. Dr. Herbert Fischer
<b>Semester</b>	1 & 2
<b>Length of module</b>	2 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	9.0
<b>Workload</b>	Class Time: 90 hours, 45 hours (bb) Virtual Teaching: 0 hours, 45 hours (bb) Independent Study: 180 Hours, 180 hours (bb) Total: 270 hours
<b>Language of instruction</b>	German
<b>Admission requirements /</b>	-

<b>prerequisites</b>	
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

## E2104 Software Engineering

### Learning objectives

The students will become introduced to software development processes and modelling methods in theory and practice and will gain the ability to apply them. Furthermore, they will be able to apply advanced programming concepts of an object oriented programming language to solving application problems from the field of business informatics.

### Content

1. Part A: Methods of Software Engineering
  - 1.1 Key principles and concepts of software engineering
  - 1.2 Principles and models of software engineering
  - 1.3 Basic procedural concepts for analysis and definition
  - 1.4 Procedural methods for design and realization
  - 1.5 Paradigms of object orientation
  - 1.6 Object oriented methods for analysis and design (OOAD)
  - 1.7 Examples of application and case studies
2. Part B: Advanced Programming Concepts of Object Orientation
  - 2.1 Basic syntax C + +
  - 2.2 Dynamic memory management
  - 2.3 Dynamic data structures
  - 2.4 Polymorphism
  - 2.5 Operator overloading
  - 2.6 Templates

### Recommended literature

#### Part A:

Balzert, H., Lehrbuch der Softwaretechnik: Softwaremanagement, Spektrum, Heidelberg, Berlin, Oxford, 2008

Fischer, H. et.al., Geschäftsprozesse realisieren, Vieweg-Verlag, Wiesbaden, 2006

Forbrig, P., Objektorientierte Softwareentwicklung mit UML, Hanser Verlag, München, 2007

Rajlich, V. et.al., Software Cultures and Evolution, IEEE Computer, Sept. 2001  
 Rupp, Chris, UML2 glasklar, Hanser-Verlag, München, 2007

Sommerville, I.: Softwareengineering, 8. Aufl., Verlag Pearson Studium, München, 2007

### **Part B:**

Einsenecker, Ulrich, C++: Der Einstieg in die Programmierung, 1. Auflage, W3L GmbH, Witten, 2008

Kirch-Prinz Ulla, Kirch Peter, C++ Lernen und professionell anwenden, , 2.Auflage, mitp, Bonn 2002

May Dietrich, Grundkurs Softwareentwicklung mit C++, 2.Auflage, Vieweg Verlag, Wiesbaden,2006

### **Tools:**

Dev-C++ from Bloodshet (free software): <http://www.bloodshed.net/dev/>

### **Admission requirements and recommended prerequisites**

Principles of Software Development

### **Teaching and learning methods**

Seminar-style lesson

### **Type of examination**

Written assignment and written exam, 90 min.

## **E1107 Principles of Software Development**

### **Learning objectives**

The students will become familiar with the basic principles of an object-oriented programming language in theory and practice and will be able to use it to solve simple application problems from the field of business informatics.

### **Content**

1. Principles of Object Orientation
  - 1.1 Overview
  - 1.2 Data abstraction
  - 1.3 Encapsulation
  - 1.4 Inheritance
  - 1.5 Polymorphism
  - 1.6 Objects
  - 1.7 Classes
  - 1.8 Inheritance



2. Principles of Object-Oriented Programming (OOP) in C++
  - 2.1 Development of C++
  - 2.2 C++ programming
  - 2.3 C++ programming environment
  - 2.4 The first C++ program
3. Basic Syntax, Part 1
  - 3.1 Expression and instructions
  - 3.2 Data types and variables
  - 3.3 Computing operators
  - 3.4 Input and output
4. Classes Concept in C++
  - 4.1 Attributes of a class in C++
  - 4.2 Methods of a class in C++
  - 4.3 Basic Syntax, Part 2
  - 4.4 Fields
  - 4.5 Control Structures
5. Particular Class Properties and Methods
  - 5.1 Constructors / destructors
  - 5.2 Element initialisation list
  - 5.3 Function overloading
  - 5.4 Class variables
  - 5.5 Inheritance
6. Declaration and Access Control
  - 6.1 Initialisation
  - 6.2 Constructors and Destructors

## **Recommended literature**

### **Primary Literature**

Kirch-Prinz Ulla, Kirch Peter, C++ Lernen und professionell anwenden, 2.Auflage, mitp, Bonn, 2002

May Dietrich, Grundkurs Softwareentwicklung mit C++, 2.Auflage, Vieweg, Wiesbaden, 2006

### **Secondary Literature**

Balzert Helmut, Lehrbuch der Softwaretechnik, 2.Auflage, Spektrum Akademischer Verlag, Heidelberg, 2000

Bothner P. Peter, Ohne C zu C++, 1.Auflage, Vieweg, Wiesbaden, 2001

Doberkat Ernst-Erich, Das siebte Buch: Objektorientierung mit C++, B.G. Teubner, Stuttgart, Leipzig, Wiesbaden, 2000

Herrmann Dietmar, Grundkurs C++ in Beispielen, 6.Auflage, Vieweg, Wiesbaden, 2004

Hubbard John R., C++- Programmierung, 1.Auflage, mitp, Bonn, 2003

Mittelbach Henning, Programmierung in C++, 1.Auflage, B.G. Teubner, 1998

Mittelbach Henning, Einführung in C++, 1.Auflage, Fachbuchverlag Leipzig, 2002

Sedgewick Robert, Algorithmen in C++, 3. Auflage, Addison Wesley, 2002

Wilms André, C++ Programmierung, 1.Auflage, Addison-Wesley, 1997

Wilms André, C++ Programmierung lernen, 1.Auflage, Addison-Wesley, 1998

#### Tools:

Dev-C++ from Bloodshet (free software): <http://www.bloodshed.net/dev/>

#### Alternatives:

Borland, C++ Builder 5 Standard oder Borland C++ Compiler 5.5, Microsoft Visual C++

#### Teaching and learning methods

Seminar-style lesson

Virtual learning platform (iLearn)

#### Type of examination

Written assignment, written exam, 90 min.

### Module E-08 Fundamentals of Business Informatics

<b>Module name</b>	Fundamentals of Business Informatics
<b>Module no.</b>	E-08
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	E2101 Fundamentals of Business Informatics
<b>Instructors</b>	Prof. Dr. Dieter Rummler Prof. Dr. Dr. Heribert Popp Claudia Rummer
<b>Semester</b>	2
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class Time: 60 hours, 30 hours (bb) Virtual Teaching: 0 hours, 30 hours (bb)

	Independent Study: 120 Hours, 120 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	Seminar-style lesson
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90 min

## Learning objectives

The student acquires basic knowledge and skills in application and development within standard tools and systems as well as a solid know-how in spreadsheet and Database applications. He or she recognizes the intelligent use of spreadsheet and Database applications. In addition to developing a structured way of thinking, he or she also gains a basic knowledge of VBA programming. Upon completion of the course, the student understands the concept of implementing real business processes in the abstraction of a relational Database.

## Content

### Part 1 - Spreadsheets

1. Fundamentals
  - 1.1 Objects
  - 1.2 Addressing
  - 1.3 Data maintenance
2. Formulas and Functions
3. Tables
4. Pivot Tables

### Part-2

1. Structograms
2. Nassi-Schneidermann Diagrams
3. Structures
4. Loops: beginning, end, early exit
5. Top-Down Approach
6. Control Break Problem

### Part 3 - VBA in Spreadsheet Programmes

1. Macros
2. Principles of VBA Programming
  - 2.1 Objects, methods, properties and events
  - 2.2 Development environment
  - 2.3 Conventions in VBA
  - 2.4 Debugging
3. Application Examples

### Part 4 - Database Application Programmes

1. Databases: Key Concepts
  - 1.1 Normal forms

- 1.2 Object-oriented and relational data model
- 1.3 Referential Integrity
- 2. Environment of Database Application
- 3. Tables
- 4. Select Queries
- 5. Action Queries
- 6. Formulas
- 7. Statements

**Part 5 - VBA in Data Bank Application**

- 1. Macros in a Database
- 2. VBA Programming, Examples

**Part 6 - Business Application Systems**

- 1. Architecture of Application Systems
- 2. ERP Systems
- 3. Functional Considerations of ERP Systems

**Recommended literature**

<http://www.geoinformatik.uni-rostock.de/einzel.asp?ID=954>

<http://de.wikipedia.org/wiki/Tupel> [http://www.dbis.informatik.hu-berlin.de/lehre/WS0304/DBSI/Folien/folien\\_05.pdf](http://www.dbis.informatik.hu-berlin.de/lehre/WS0304/DBSI/Folien/folien_05.pdf) Hilfefunktion in Microsoft Excel, Access und VBA

Martin, René; VBA mit Excel , Hanser, München, 2008

Vonhoegen, Helmut, Excel 2007 - Das umfassende Handbuch, Galileo Press, Bonn, 2007

Kolberg, Michael, Access 2007, Markt+Technik-Verl., München, 2007

Leibing, Stefan, Access-VBA, Addison Wesley in Pearson Education Deutschland, München, 2009 Bauder, Irene, Microsoft-Access-2007-Programmierung , Hanser, München, 2007 Held, Bernd, Das Access-VBA-Codebook, Addison-Wesley, München u.a., 2005

Microsoft-SQL-Server 2000 - das Handbuch, Microsoft Press Deutschland, Unterschleißheim, 2000

**Module E-09 Mathematics**

<b>Module name</b>	Mathematics
<b>Module no.</b>	E-09
<b>Module head</b>	Prof. Dr. Johannes Grabmeier
<b>Major field</b>	-
<b>Course number and course name</b>	E2103 Mathematics

<b>Instructors</b>	Prof. Dr. Johannes Grabmeier Prof. Dr. Dr. Heribert Popp
<b>Semester</b>	2
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class Time: 60 hours Independent Study: 120 Hours Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Knowledge of mathematics from the module E-03 Fundamentals of Mathematics
<b>Teaching and learning methods</b>	Using a classical lecture style combined with the direct use of a computer algebra system, theory and applications will be illustrated. Many concepts will be worked through using concrete problems and solved with a computer algebra system. Exercises will be assigned to be completed independently by the students. Solutions for a selection of the assigned exercises will be presented by the students at the beginning of the following lecture. Alternatively, suggested solutions of the students will be discussed on the iLearn platform.
<b>Further information</b>	In Mathematics there is a 5% online portion.
<b>Type of examination</b>	Written exam 90 min

### Learning objectives

The students gain in-depth knowledge of mathematical topics which are applicable to economics and informatics or which are necessary to round out and expand on basic mathematic principles.

The focus is on mathematical thinking, working and modelling methods.

Upon completion of the module, students are in a position to recognize, model and solve real mathematical problems from business practice.

They become familiar with the mathematical foundations of soft computing. In addition, they are capable of using a computer algebra system for mathematical modelling and calculations. The appropriate algorithmic methods of mathematics will be worked through using examples.

The students are able to successfully complete advanced tasks with mathematical model generation such as Operations Research or in-depth use of cryptographic methods.

## Content

1. Affine Geometry and Eigenspace
  - 1.1 Scalar product, angle, distance, norm
  - 1.2 Affine vector space
  - 1.3 Quadrics as solution sets for quadratic equations
  - 1.4 Eigenvectors and eigenspaces
2. Complex Numbers and Trigonometric Functions
  - 2.1 Complex numbers
  - 2.2 Trigonometric functions
  - 2.3 Circle divisions and the fundamental theorem of algebra
3. Number Theory, Computer Algebra and Cryptography
  - 3.1 Divisors and Prime Numbers
  - 3.2 Euclidean Division
  - 3.3 Congruence and Modulo
  - 3.4 The extended euclidean algorithm
  - 3.5 Inverse Modulos
  - 3.6 Exponentiation of modulus
  - 3.7 Factorisation
  - 3.8 Encipherment with public keys
  - 3.9 RSA procedure
  - 3.10 Digital signature
  - 3.11 Solving polynomial systems of equations with Gröbner basis
4. Linear Differential Equations
  - 4.1 Definitions and problems in differential equation theory
  - 4.2 Solving homogenous linear differential equations
  - 4.3 Solving nonhomogenous linear differential equations
  - 4.4 Bernoulli differential equation
  - 4.5 Transformation techniques
5. Selected Chapters of Numerical Analysis
  - 5.1 Floating-point arithmetic and rounding error
  - 5.2 Horner Scheme
  - 5.3 Iteration for determining zeros
6. Soft Mathematics Methods
  - 6.1 Fuzzy logic and mathematics
  - 6.2 Mathematics of neural networks
  - 6.3 Genetic algorithms

## Recommended literature

Bauer, Ch., Clausen, M., Kerber, A., Meier-Reinhold, H., Mathematik für Wirtschaftswissenschaftler, Schäffer-Poeschel, 5. überarbeitete Aufl., 2008

J. Buchmann, Einführung in die Kryptographie, 4. erweiterte Aufl., Springer-Verlag, Heidelberg, 2008

G. Fischer, Analytische Geometrie, Vieweg+Teubner, 7., durchges. Aufl., 2001

von zur Gathen, J., Gerhard, J., Modern Computer Algebra, Cambridge-University Press, 1999

Hämmerlin, G., Hoffmann, K.-H., Numerische Mathematik, 4. Auflage, Springer-Verlag, Berlin, 1994

Jenks, R. D., Sutor, R. S., AXIOM -- The Scientific Computation System, Springer Verlag, Heidelberg, 1992

Walter, W., Gewöhnliche Differentialgleichungen, 7. neubearb. u. erw. Aufl., Springer-Verlag, Berlin, 2000

Tilli, T. A. W., Fuzzy-Logik, 2. Auflage, Francis, 1992

Popp, H., Anwendungen der Fuzzy-Set-Theorie in Industrie- und Handelsbetrieben, Wirtschaftsinformatik, 1994

König u.a., Taschenbuch der Wirtschaftsinformatik und Wirtschaftsmathematik, Harri Deutsch, Frankfurt a. Main, 2003

### Module E-10 Statistics

<b>Module name</b>	Statistics
<b>Module no.</b>	E-10
<b>Module head</b>	Prof. Dr. Johannes Grabmeier
<b>Major field</b>	-
<b>Course number and course name</b>	E3106 Inductive Statistics E2105 Descriptive Statistics
<b>Instructors</b>	Prof. Dr. Johannes Grabmeier Stefan Hagl
<b>Semester</b>	2 & 3
<b>Length of module</b>	2 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	8.0
<b>Workload</b>	Class Time: 75 hours, 0 hours (bb) Virtual Teaching: 0 hours, 72 hours (bb) Independent Study: 165 Hours, 168 hours (bb) Total: 240 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### E2105 Descriptive Statistics

#### Learning objectives

The students are familiar with the concepts of descriptive statistics, specifically of univariate and bivariate descriptions. They are in a position to recognize, model and solve statistical problems from this field related to business practice. Furthermore they are able to utilize software tools such as the statistic functions in MS Excel or Open Office Calc.

### **Recommended literature**

Falk, Becker, Marohn, *Angewandte Statistik mit SAS*, Springer, Berlin, 1995

Georgii, H.O., *Stochastik, Einführung in die Wahrscheinlichkeitstheorie und Statistik*, Walter de Gruyter, Berlin, 2002

Monka, Michael, Voss, Werner, Schöneck, Nadine, *Statistik am PC, Lösungen mit Excel, 5., aktualisierte und erweiterte Auflage*, Hanser-Verlag, München, 2008

Pflaumer, Heine, Hartung, *Statistik für Wirtschafts- und Sozialwissenschaftler, Deskriptive Statistik*, Oldenbourg, München, 2001

Puhani, *Statistik, Einführung mit praktischen Beispielen*, Lexika-Verlag, Würzburg, 2005

Stockburger, David W., *Introductory Statistics, Concepts, Models, and Applications*, <http://www.psychstat.missouristate.edu/sbk00.htm>

Wernecke, Klaus-Dieter, *Angewandte Statistik in der Praxis*, Addison-Wesley, München, 1995

Zwerenz, Karlheinz, *Statistik verstehen mit Excel*, R. Oldenbourg Verlag, München Wien, 2008

### **Admission requirements and recommended prerequisites**

Knowledge of mathematics from the module Fundamentals of Mathematics

### **Teaching and learning methods**

Using a classical lecture style, theory and applications will be illustrated. Many concepts will be worked through using concrete problems and solved with a software tool. Exercises will be assigned to be completed independently by the students. Solutions for a selection of the assigned exercises will be presented by the students at the beginning of the following lecture. Alternatively, students' suggested solutions will be discussed on the iLearn platform.

### **Type of examination**

Written exam, 60 min.

## **E3106 Inductive Statistics**



## Learning objectives

The students are familiar with the concepts of inductive statistics based on probability theory. Statistical problems that arise in the practice of extrapolating from a sample to an entire population can be solved using a statistical method of estimating parameters, performing parametric hypothesis tests, or a goodness-of-fit test depending on the topic at hand. Furthermore, the students are capable of developing the necessary models with random variables, bump functions and their probability distributions. They are also able to use software tools such as the statistic functions in MS Excel or Open Office Calc.

## Content

1. Basic Probability Theory
  - 1.1 Probability concepts
  - 1.2 Random experiments and events
  - 1.3 Axioms according to Kolmogorov
  - 1.4 Two-step experiments and conditional probability
  - 1.5 Bayes' Theorem
2. Random Variables
  - 2.1 Random variables
  - 2.2 Discrete probability distributions and distribution function
  - 2.3 Continuous probability distribution and density function
  - 2.4 Expected value and variance of a random variable
3. Distributions I
  - 3.1 Binomial distribution
  - 3.2 Normal distribution
  - 3.3 Multinomial distribution
  - 3.4 Hypergeometric distribution
  - 3.5 Poisson distribution
4. Sample Distributions
  - 4.1 Samples
  - 4.2 Sample selection
  - 4.3 Sample distribution
5. Central Limit Theorem and Applications
  - 5.1 Central limit theorem
  - 5.2 Sample distribution of the mean
  - 5.3 Sample distribution of the proportional value
  - 5.4 Sample distribution of standard deviations
  - 5.5 Sample distribution of differences
6. Parametric Hypothesis Tests
  - 6.1 Null hypotheses and test theory
  - 6.2 Decision errors
  - 6.3 Mean and proportional value, standard deviation and difference tests
  - 6.4 Statistical significance of a test
7. Estimation Theory
  - 7.1 Point estimation procedure: method of moments
  - 7.2 Point estimation procedure: maximum likelihood
  - 7.3 Statistical significance criteria
  - 7.4 Interval estimation and confidence interval
8. Distributions II
  - 8.1 Student-t distribution
  - 8.2 Chi-squared distribution

- 8.3 F-distribution
- 9. Parametric hypothesis tests with small samples
  - 9.1 Proportional value test - binomial test
  - 9.2 Proportional value difference test - Fisher's exact test
  - 9.3 Mean and differences of the means test
  - 9.4 Variance quotient test
- 10. Goodness-of-fit tests
  - 10.1 Distribution hypotheses
  - 10.2 Chi-squared goodness of fit test
  - 10.3 Independence tests

### **Recommended literature**

Falk, Becker, Marohn, Angewandte Statistik mit SAS, Springer Verlag, Berlin, 1995

Georgii, H.O., Stochastik, Einführung in die Wahrscheinlichkeitstheorie und Statistik, Walter de Gruyter, Berlin, 2002

Monka, Michael, Voss, Werner, Schöneck, Nadine, Statistik am PC, Lösungen mit Excel, 5., aktualisierte und erweiterte Auflage, Hanser-Verlag, München, 2008

Pflaumer, Heine, Hartung, Statistik für Wirtschafts- und Sozialwissenschaftler, Deskriptive Statistik, Oldenbourg, München, 2001

Puhani, Statistik, Einführung mit praktischen Beispielen, Lexika-Verlag, Würzburg, 2005

Stockburger, David W., Introductory Statistics, Concepts, Models, and Applications, <http://www.psychstat.missouristate.edu/sbk00.htm>

Wernecke, Klaus-Dieter, Angewandte Statistik in der Praxis, Addison-Wesley, München, 1995

Zwerenz, Karlheinz, Statistik verstehen mit Excel, R. Oldenbourg Verlag, München Wien, 2008

### **Admission requirements and recommended prerequisites**

Knowledge of mathematics from the module Fundamentals of Mathematics, knowledge from the course, "Descriptive Statistics".

### **Teaching and learning methods**

In the classic lecture style, theory and applications will be illustrated. Many concepts will be worked through using concrete problems and solved with a software tool. Exercises will be assigned to be completed independently by the students. Solutions for a selection of the assigned exercises will be presented by the students at the beginning of the following lecture. Alternatively, suggested solutions of the students will be discussed on the iLearn platform.

## Type of examination

Written exam, 90 min.

## Module E-11 General Studies Elective Module

<b>Module name</b>	General Studies Elective Module
<b>Module no.</b>	E-11
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	Z2100 General Studies Mandatory Elective I Z4100 General Studies Mandatory Elective II
<b>Instructors</b>	Various instructors, dependent on course selected Stefan Hagl Prof. Dr. Karlheinz Zwerenz
<b>Semester</b>	2, 3 & 4
<b>Length of module</b>	3 semesters
<b>Module frequency</b>	semi-annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	4.0
<b>Workload</b>	Class Time: 60 hours Independent Study: 60 hours Total: 120 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	The number of participants is limited (max. 40 for non-language courses and 25 for foreign languages). For selected advanced language courses, the necessary level of language competence must be demonstrated (through successful completion of the previous level or a placement test). Otherwise there are no prerequisites.
<b>Teaching and learning methods</b>	Mainly seminar-style classes, exercises and project work
<b>Further information</b>	Some general studies electives form subject groups of related, consecutive courses with which students can gain an additional qualification (e.g. Start-up management and Company Succession through completion of the courses Start-Up Management, Business Plan Game, and Company Succession). Consecutive courses are also offered in languages. Some language courses are additionally offered as holiday courses during the semester breaks.

	The courses can also be completed as voluntary general studies electives. Course specifics can be found in the course description of the selected course.
<b>Type of examination</b>	-

### **Learning objectives**

Through the General Studies Elective Module, students are able to gain knowledge and skills that extend beyond their major subject. There is a broad spectrum of subjects offered. General Studies elective courses are offered centrally at the Deggendorf Institute of Technology through the Electives and Languages Department (AWP- und Sprachenzentrum). Students can choose regular courses as well as courses from the virtual University of Bavaria (VHB). The course content relates primarily to the following areas:

- languages (this is the main area)
- didactics and pedagogics
- social sciences
- psychology and sociology
- technical-scientific field
- philosophy and socio-ethics
- business administration(not for programmes from the faculty of Business Administration and Business Informatics)

The students can select their courses within the range of electives offered and thus deepen knowledge in their own areas of interest.

### **Content**

The concrete content can be found in the specific course description.

## **Z2100 General Studies Mandatory Elective I**

### **Learning objectives**

Please refer to the specific elective course description for concrete course objectives.

### **Content**

The concrete course content can be found in the course description of the specific course.

### **Recommended literature**

Recommended literature can be found in the course description of the specific course.

### **Type of examination**

Written exam, 60 min.

## Z4100 General Studies Mandatory Elective II

### Learning objectives

Please refer to the specific elective course description for concrete course objectives.

### Content

The concrete course content can be found in the course description of the specific course.

### Recommended literature

Recommended literature can be found in the course description of the specific course.

### Type of examination

Written test or assignment

## Module E-12 Operating Systems and Computer Architecture

<b>Module name</b>	Operating Systems and Computer Architecture
<b>Module no.</b>	E-12
<b>Module head</b>	Prof. Dr. Horst Kunhardt
<b>Major field</b>	-
<b>Course number and course name</b>	E3105 Computer Architecture and Microprocessor Technology E3101 Operating Systems
<b>Instructors</b>	Prof. Dr. Horst Kunhardt Instructor Wolfgang Stern Prof. Dr. Andreas Penningsfeld
<b>Semester</b>	3
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	8.0
<b>Workload</b>	90 hours, 63 hours (bb) Virtual Teaching: 0 hours, 21 hours (bb) Independent Study: 150 Hours, 156 hours (bb) Total: 240 hours
<b>Language of instruction</b>	German

<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

## **E3105 Computer Architecture and Microprocessor Technology**

### **Learning objectives**

Participants of the course gain an overview of the physical foundations of informatics and their application in computer engineering. They are familiar with the different computer architectures and the technology of microprocessors. Furthermore, they gain the ability to conceive and design host name programme in a software architectural model. They are familiar with the methods of computer assessment and can apply them in practice.

### **Content**

1. Basic Computer Architectures; e.g. von Neumann and Harvard Architectures
2. Uniprocessor and Multiprocessor systems
3. Distributed Systems
4. Functioning of Microprocessors and Periphery
5. Components of Computer Systems
6. Technology and Standards of Bus Systems
7. Firmware (embedded software)
8. Introduction to the MMIX Processor
9. Machine-oriented Programming with the MMIX Instruction Set and the Simulation Environment
10. Computer Performance

### **Recommended literature**

Anlauff, H., Böttger, A., Ruckert, M., Das MMIX-Buch - eine praxisnahe Einführung in die Informatik, Springer, Springer, 2002

Patterson, D.A., Hennesy, J.L., Rechnerorganisation und -entwurf, Elsevier, Heidelberg, 2005

Tanenbaum, A., Computerarchitektur - Strukturen, Konzepte, Grundlagen, Prentice-Hall, 2005

### **Teaching and learning methods**

Seminar-style lesson with practice exercises

### **Type of examination**

Written test or assignment

## **E3101 Operating Systems**

### **Learning objectives**

The students get a glimpse into the significance of operating systems as the central foundation for the processing of information in companies and develop an understanding of the characteristics of current operating systems. They become familiar with the concepts and technologies necessary for the creation of operating systems and gain a knowledge of their modular design and functioning. Furthermore, they gain knowledge and skills in the configuration, administration and the safe application of operating systems using the example of commercial operating systems. The students will also gain insight into the theoretical foundations of a Linux system as well as an overview of the most important shell commands. Upon completion of the course they are able to install and administer a Linux server.

### **Content**

Operating systems form the basis for application software. They control and coordinate the allocation of resources and ensure the fair and secure working of users in a computer system. Users of a computer system (system administrators, programmers, users) require a basic knowledge of the functioning of operating systems in order to properly interpret the behaviour of computer systems.

Students will gain an in-depth knowledge of the following topics:

1. Basic concepts and the general structure of an operating system
2. System architecture of commercial operating systems (Windows, UNIX)
3. Basic mechanisms (interrupt handlers, synchronisation)
4. System components of commercial operating systems
5. Administration mechanisms in operating systems using the example of Windows Registry
6. The concept of processes and threads
7. Memory management
8. Implementation of an Enterprise Architecture system
9. Implementation of a file system
10. Security of operating systems
11. Properties of network operating systems
12. The concept and the application of Active Directory
  
13. Administration of operating systems

Practical exercises using configuration examples from Windows and UNIX operating systems serve to transfer knowledge gained in the lectures into skills and know-how. Work in project teams, the presentation of solutions and discussions about results help to develop the skills necessary to meet practical requirements and challenges in a business setting.

Further subject areas:

1. Principles and concepts of the operating system Linux
2. Shell Command Sets
3. Configuration of a Linux system
4. Linux in server operation, using the example of a web server
5. In addition to the theoretical principles of Linux, working with a Linux system will also be taught through comprehensive practical exercises.

### Recommended literature

Tanenbaum, A.S., Moderne Betriebssysteme, Prentice Hall, 2009  
 Stallings, W., Operating Systems Internals and Design Principles, Prentice Hall, 2005  
 Kofler, Michael, Linux, Installation, Konfiguration, Anwendung, 7. Auflage, Addison-Wesley, München, 2004

### Teaching and learning methods

Seminar-style lesson, exercises

Excursion: Computer Centre

### Type of examination

Written exam, 90 Min.

### Module E-13 Databases

<b>Module name</b>	Databases
<b>Module no.</b>	E-13
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	E3102 Databases
<b>Instructor</b>	Prof. Dr. Dieter Rummler
<b>Semester</b>	3
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	60 hours, 25 hours (bb) Virtual Teaching: 0 hours, 21 hours (bb) Independent Study: 120 Hours, 134 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning</b>	Seminar-style lesson



<b>methods</b>	
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90 min

## Learning objectives

Students understand the significance of Databases. They become familiar with approaches to creating a data model and can apply them to a concrete Database. Within the scope of this course, they learn how to access relational Databases with SQL and develop applications on the basis of a Database. Participants gain knowledge of performance optimization in the storage of and access to data and understand the interplay of application, presentation and Database servers in programming.

## Content

1. Data modelling
  - 1.1 Redundancy
  - 1.2 Data modelling
  - 1.3 Object oriented
  - 1.4 Relational
  - 1.5 Normalisation
2. SQL
  - 2.1 SQL server Database
  - 2.2 Logging into a server
  - 2.3 Creating a Database and transaction protocol
  - 2.4 Tables
  - 2.5 Data models
  - 2.6 Views
  - 2.7 TSQL, Transact SQL
3. User-defined Functions
  - 3.1 Stored procedures
  - 3.2 Trigger
  - 3.3 Client server architecture
  - 3.4 Security concept
  - 3.5 .integrating .net code in SQL server
  - 3.6 XML
  - 3.7 Sql server and web services via endpoints
  - 3.8 Report services
4. Database Applications with .net
  - 4.1 Direct Database access
  - 4.2 Processing data with stored procedures
  - 4.3 Reading sequentially forward with DataReader
  - 4.4 Programming
  - 4.5 Distributed applications
  - 4.6 Web services
  - 4.7 Processing XML data
5. Memory Models
  - 5.1 Destinations in data storage and access
  - 5.2 ACID
  - 5.3 Sequential data organisation
  - 5.4 Index sequential data organization
  - 5.5 Relative phrase organisation

- 5.6 Trees
- 5.7 Database concepts

### Recommended literature

Steiner, René, Grundkurs Relationale Datenbanken, Vieweg + Teubner, Wiesbaden, 2009

Preiß, Nikolai, Entwurf und Verarbeitung relationaler Datenbanken, Oldenbourg, München u.a., 2007

Mertins, Dirk, SQL Server 2008, Galileo Press, Bonn, 2009

Kansy, Thorsten, Datenbankprogrammierung mit .NET 3.5, Hanser, München, 2008

Staud, Josef L., Datenmodellierung und Datenbankentwurf, Springer, Berlin u.a., 2005

### Module E-14 Macroeconomics and Economic Policy

<b>Module name</b>	Macroeconomics and Economic Policy
<b>Module no.</b>	E-14
<b>Module head</b>	Prof. Dr. Rüdiger Akhotmee
<b>Major field</b>	-
<b>Course number and course name</b>	E3107 Macroeconomics and Economic Policy
<b>Instructors</b>	Prof. Dr. Rüdiger Akhotmee Prof. Dr. Johann Nagengast
<b>Semester</b>	3
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	3.0
<b>ECTS</b>	4.0
<b>Workload</b>	45 hours, 21 hours (bb) Virtual Teaching: 0 hours, 21 hours (bb) Independent Study: 75 Hours, 78 hours (bb) Total: 120 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	No special prerequisites.
<b>Teaching and learning methods</b>	Seminar-style lesson, exercises
<b>Further information</b>	The supplementary course, "Economic Policy" is offered by the Virtual University of Bavaria (VHB)
<b>Type of examination</b>	Written exam 90 min

### Learning objectives

The students gain a basic understanding of the economic interdependencies in a national economy and in all the actors in the economic process (households, businesses). They are familiar with the underlying concepts and theories. The students can evaluate basic possible economic controls. They are able to think critically about the causes of economic disparities and can predict their effects; furthermore they can explain the instruments and functioning of national economic policy. The module also enables the students to recognize and evaluate issues in economics and economic policy.

The students gain a fundamental basic knowledge of general macroeconomics and develop an application-oriented understanding of the difference between the macro- and the business level of economics. They become familiar with the theoretical principles and through practical examples, they develop the ability to apply the theoretical knowledge they have gained to socially and economically relevant areas of everyday life.

### **Content**

1. Overview of the actors, objectives and tools in economic policy; insight into the possibilities and limitations of economic policy-making in light of current societal and ecological challenges
2. General economic policy:
  - 2.1 Insight into the domestic and foreign economic causes and consequences of macroeconomic instability (inflation, unemployment, limited growth, macroeconomic fluctuations and cycles)
  - 2.2 Overview of the possibilities and limitations of stabilization policies
  - 2.3 Structural adjustment policy at a glance
3. Macroeconomic instabilities, stabilisation and structural policy
  - 3.1 A glimpse into the significance of financial and lending institutions including the interplay between monetary and real value
  - 3.2 Introduction to lending and monetary policy instruments
4. Money, Credit and Currency
  - 4.1 Insight into the significance of national revenue and spending as well as public debt
  - 4.2 Introduction to financial policy instruments
5. National Budget and Financial Policy
  - 5.1 Understanding of economic policy developments and global thinking (in particular european integration, issues in developing countries, multilateral relations)
  - 5.2 Knowledge of interdependencies between foreign economic and monetary policy
  - 5.3 Overview of international monetary and economic organizations
6. Foreign Trade, International Economic and Monetary Order

### **Recommended literature**

Bofinger, P., Grundzüge der Volkswirtschaftslehre, 2. Auflage, Pearson Studium, München 2007

Puhani, J., Volkswirtschaftslehre für Betriebswirte, 3. Auflage, Oldenbourg, München 2009

## Module E-15 Software Engineering

<b>Module name</b>	Software Engineering
<b>Module no.</b>	E-15
<b>Module head</b>	Prof. Dr. Johannes Grabmeier
<b>Major field</b>	-
<b>Course number and course name</b>	E4101 Fundamentals of ERP Programming E4106 Object-Oriented Software Engineering
<b>Instructors</b>	Prof. Dr. Johannes Grabmeier Prof. Dr. Dieter Rummler Prof. Dr. Josef Schneeberger
<b>Semester</b>	4
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	10.0
<b>Workload</b>	90 hours, 67 hours (bb) Virtual Teaching: 0 hours, 23 hours (bb) Independent Study: 180 Hours, 180 hours (bb) Total: 270 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

In this course, students learn the key principles of programming within ERP systems (multi-layer client-server architectures and service-oriented architecture). In so doing, not only programming techniques but also their order within ERP systems is paramount. To achieve this end, a classic procedural programming model with access to a relational Database will be outlined:

- Understand the special requirements of mass data processing in ERP systems
- Develop know-how in finding and retrieving Database data
- Understand the interplay of application, presentation and Database servers in programming
- Become familiar with concrete programming techniques
- Ability to recognise and eliminate performance problems
- Recognise advantages / disadvantages of standard software vs. individual softwar

In addition, the students gain knowledge of object-oriented software engineering. They acquire knowledge and skills in an object-oriented programming language such as Java. They are in a position to develop programmes in this object-oriented programming language and to analyse and

evaluate existing complex programming systems. Furthermore, they can utilize a standard development tool such as Eclipse.

## **E4101 Fundamentals of ERP Programming**

### **Content**

1. Client Server Architectures and Service Oriented Architecture in the ERP environment
2. Programming Tools
3. Programming Editor Interface
4. Basic Principles
5. Commentary
6. Data Types and Data Variables
7. Output
8. Parameter Entry
9. String Processing
10. Data Storage in Databases and Data Dictionary
11. Database Access with SELECT
12. Searching for Database Data
13. Creating New Databases
14. Tables
15. Data Elements
16. Domains
17. Foreign Keys
18. Indices
19. Append Structures
20. Views
21. Internal Tables
22. Definition
23. Fill
24. Processing
25. Changing Data in Internal Tables
26. Changing Data in Transparent Tables
27. Modularity of Programmes
28. Forms
29. Function Modules
30. Advanced Techniques
31. Interactive Lists
32. Enhancements / User Exits for Individual Programming in Standard Software
33. Match Code
34. Background Processing
35. Lock Logic to Prevent Parallel Data Revisions
36. Batch Input for Automated Workflows

### **Recommended literature**

Keller, Horst, ABAP objects, Galileo Press, Bonn u. a., 2008

Färber, Günther, ABAP-Grundkurs, Galileo Press, Bonn u.a., 2008

### **Teaching and learning methods**

Seminar-style Lesson

### **Type of examination**

Written exam, 60 min.

## **E4106 Object-Oriented Software Engineering**

### **Content**

1. Introduction
  - 1.1 Paradigms in Software Development
  - 1.2 What is Java?
  - 1.3 The simple Java Development Environment SDK/JKD
2. Fundamentals of the Programming Language Java
  - 2.1 Hello Java
  - 2.2 Format of Java programmes
  - 2.3 Structure and programme elements on simple Java applications
  - 2.4 API and packets
  - 2.5 Imperative Programming Elements
3. Eclipse Development Environment
4. Basic Concepts of Object-Oriented Programming
  - 4.1 Object-oriented programming
  - 4.2 Encapsulation
  - 4.3 Constructors
  - 4.4 Inheritance techniques
  - 4.5 Class variables and class methods
  - 4.6 Abstract classes and interfaces
  - 4.7 Declarations and modifiers
  - 4.8 Data and data structures
  - 4.9 Parameterised data types and generics
5. Graphic Concepts and Interaction
  - 5.1 Applets and simple graphics, frames
  - 5.2 Interface programming with AWT, JFC, Swing
  - 5.3 Concepts of Event Handling
  - 5.4 Handling Error and Exceptions
  - 5.5 Libraries and Concepts of Multimedia Programming
6. Data Streams and Serialisation
  - 6.1 Streams
  - 6.2 Serialisation
7. Parallel Software Techniques
  - 7.1 Threads and Processes
  - 7.2 The Monitor Concept
8. Network Techniques
  - 8.1 Client-server model
  - 8.2 Remote Methods and RMI
9. Database Connection

## Recommended literature

Daum, Berthold, Java-Entwicklung mit Eclipse 3.1, Anwendungen, Plugins und Rich Clients, 3. Aufl. dpunkt.verlag, Heidelberg, 2005

Krüger, Guido, Handbuch der Java-Programmierung, Addison Wesley Longman, <http://www.javabuch.de/download>

Java Developer Site of the Company, [sunvhttp://java.sun.com](http://java.sun.com)

Jobst, Fritz, Einführung in Java, mit CD-ROM, Fachbuchverlag Leipzig, 2001

Goll, Joachim, Weiß, Cornelia, Müller, Frank, Java als erste Programmiersprache - vom Einsteiger zum Profi, 3. Aufl. 2001, Teuber Verlag, Stuttgart, 2000

Schulz, Kay, Java - professionell programmieren, Springer-Verlag, Berlin, 2000

Walsh, Aaron, Fronckowiak, Johan, Java - das mitp-Standardwerk zur professionellen Programmierung mit Java, mitp, Berlin, 2000

Ullenboom, Christian, Java ist auch eine Insel, Galileo Computing, 8. Auflage, Galileo Press, Bonn, 2009, <http://openbook.galileocomputing.de/javainsel8/>

JDK 6 Documentation der Firma Sun, <http://java.sun.com/javase/6/docs/>

Eclipse Online Documentation, <http://www.eclipse.org/documentation/>

Jung, Elisabeth, Java 6 - Das Übungsbuch, mitp, Redline GmbH, Heidelberg, 2007

Sierra, Kathy, Bates, Bert, Sun Certified Programmer for Java 5, McGraw-Hill, 2006

Ratz, Dietmar, Scheffler, Jens, Seese, Detlef, Grundkurs Programmieren in Java, Hanser Verlag, 2. Auflage, 2004

## Admission requirements and recommended prerequisites

Knowledge from the module Software Development

## Teaching and learning methods

Seminar-style lesson in the computer lab alternates between a traditional lecture style for the theoretical concepts of object-oriented software technology and the opportunity for students to independently solve programming tasks. The instructor supports the students individually in achieving this. Students present their solutions in short presentations.

## Type of examination

Written test or assignment

## Module E-16 Operations Research

<b>Module name</b>	Operations Research
<b>Module no.</b>	E-16
<b>Module head</b>	Prof. Dr. Johannes Grabmeier
<b>Major field</b>	-
<b>Course number and course name</b>	E4104 Operations Research
<b>Instructors</b>	Prof. Dr. Johannes Grabmeier Instructor Prof. Dr. Michael Lutz
<b>Semester</b>	4
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 60 hours Independent Study: 120 Hours Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Mathematical knowledge from the modules Fundamentals of Mathematics and Mathematics
<b>Teaching and learning methods</b>	Theory and applications will be imparted in a classic lecture in the context of a seminar-style lesson. Practice exercises to be completed independently will be assigned. Solutions for a selection of the assigned exercises will be presented by the students at the beginning of the following lecture. In addition, suggested solutions of the students will be discussed in the iLearn system.
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90-120 min

### Learning objectives

Students are familiar with the most important Operations Research (OR) procedures for mathematical solutions to optimisation problems in economics. They are capable of recognising, modelling and solving optimisation tasks from business practice. A selection of typical application examples which they will have become familiar with completing this module will help aid them in doing this. They have also been introduced to a software tool as a computer-assisted solution to OR tasks.

### Content

1. Introduction to OR



- 1.1 The term OR
- 1.2 Planning Process
- 1.3 Historical development
- 1.4 Characterising forms of modelling
- 1.5 Overview of problems and procedures
2. Linear Optimisation and Simplex Algorithms
  - 2.1 Graphic solutions to two-dimensional problems
  - 2.2 Convex polyhedron theory
  - 2.3 Simplex Algorithm
  - 2.4 Special problems and variants of the simplex algorithm
  - 2.5 Dual linear optimisation problems
  - 2.6 Sensitivity analysis
3. Special Cases of Linear Optimisation
  - 3.1 The Transport Problem
  - 3.2 The Transshipment Problem
  - 3.3 The Assignment Problem
4. Non-linear Optimisation
  - 4.1 Principles of non-linear optimisation: convex and quadratic optimization models
  - 4.2 Lagrange Multipliers and Kuhn-Tucker Conditions
  - 4.3 Wolfe Method
  - 4.4 Gradient Descent
5. Discrete Optimisation and Utilising XPRESS
  - 5.1 Concepts of discrete optimization
  - 5.2 Important problem types of discrete optimization
  - 5.3 Intensive training: IP/MIP modelling and solutions with XPRESS
  - 5.4 XPRESS as a simulation tool (shadow prices, reduced costs, etc.)
6. Algorithms for Solving Discrete Optimisation Problems
  - 6.1 The Branch-and-bound solution method for IP and MIP Problems
  - 6.2 Karmarkar's interior point method
  - 6.3 The Cutting-plane method
  - 6.4 Heuristic methods
  - 6.5 Runtime behaviour
7. Game Theory: an Overview
  - 7.1 Game theory and economic behaviour
  - 7.2 Examples of simple games and the Nash equilibrium
  - 7.3 Mixed strategy equilibrium

### Recommended literature

Bauer, Ch., Clausen, M., Kerber, A., Meier-Reinhold, H., Mathematik für Wirtschaftswissenschaftler, Schäffer-Poeschel, 5. überarbeitete Aufl., 2008

Borgwardt, K. H., Optimierung, Operations Research, Spieltheorie - Mathematische Grundlagen, Birkhäuser Verlag, Basel, 2001

Domschke, W., Drexl, A., Einführung in das Operations Research, Springer Verlag, 7., überarb. Aufl., 2007

Domschke, W., Drexl, A., Klein, R., Scholl, A., Voß, S., Übungen und Fallbeispiele zum Operations Research, Springer Verlag, 6. Aufl., 2008

Ellinger, Th., Beuermann, G., Leisten, R., Operations Research -eine Einführung, 5. Aufl., Springer Verlag, Heidelberg, 2003

Gintis, H., Game Theory evolving, Princeton Univ. Press, 2000

Hillier, F. S., Liebermann, G.J., Operations Research: Einführung, 5. Aufl., Oldenbourg Verlag, München, 2005

Jungnickel, D., Optimierungsmethoden, Springer Verlag Heidelberg, 2. Aufl. 2008  
Kallrath, J., Wilson, J. M., Business Optimisation, MacMillan, 1997

Lutz, M., Operations Research-Verfahren verstehen und anwenden, Fortis Verlag FH Köln

Marti, K., Gröger, D., Einführung in die lineare und nichtlineare Optimierung, Physica-Verlag, 2000

Neumann, K., Morlock, M., Operations Research, Hanser Verlag, 1993

Osborne, M. J., An introduction to game theory, Oxford Univ. Press, 2004

Sierksma, G., Linear and Integer Programming, 2nd ed., Marcel Dekker, 2002

Stingl, P., Operations Research: Linearoptimierung. Fachbuchverlag Leipzig, 2002

Winston, W. L., Operations Research, Applications and Algorithms, Third Edition. International Thomson Publishing, Duxbury Press, Belmont, California, 1997

Wolsey, L. A., Integer Programming, Wiley, 1998

Zimmermann, H.-J., Operations Research, Methoden und Modelle, Für Wirtschaftsingenieure, Betriebswirte, Informatiker, Mathematiker, Vieweg, Wiesbaden, 2005

XPRESS von Firma dashoptimization, UK, siehe: [www.dashoptimization.com](http://www.dashoptimization.com)

## Module E-17 Business Organisation

<b>Module name</b>	Business Organisation
<b>Module no.</b>	E-17
<b>Module head</b>	Prof. Dr. Michael Ponader
<b>Major field</b>	-
<b>Course number and course name</b>	E4105 Organisation E4107 Business Management
<b>Instructors</b>	Prof. Dr. Horst Kunhardt

	Prof. Dr. Michael Ponader Prof. Dr. Herbert Fischer Prof. Dr. Suzanne Lachmann
<b>Semester</b>	4
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	6.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 90 hours, 44 hours (bb) Virtual Teaching: 0 hours, 44 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

Participants in the module gain an overview of organisation as a management task and recognise its significance in operational information and decision-making processes. They gain a knowledge of the instruments of structure and procedure organization and skills in working with key organisation methods and techniques. Furthermore they gain a knowledge of the various typologies of leaders. They are able to analyse the meaning of corporate social responsibility and to weigh advantages and disadvantages. The students can transfer these theoretical concepts to practical issues and recognise their significance in business practice.

In a Business Plan Game, they apply their knowledge holistically to business management and to the tasks of the specific business functional departments and they understand the interconnectivity of business decisions.

## E4105 Organisation

### Content

1. Organisation as a Management Task
2. Overview of the Field of Organisation and its Operational Classification
3. Structural and Procedural Organisation and Key Organisation Principles
4. System Organisation and Cybernetics
5. Methods and Instruments of Organisational Design
6. Organisation Processes and Organisation Cycles
7. Office Technology and Office Organisation
8. Introduction to Organisation Theory of Business Processes

9. Identifying Business Processes
10. Procedure Model for Implementing Process Organisation
11. Business Process Optimisation
12. Business Process Modelling with Tools
13. Case Study of Business Process Analysis, Business Process Management and Business Process Optimisation

### **Recommended literature**

Bühner, R., Betriebswirtschaftliche Organisationslehre, Oldenbourg, München, wie 10. Auflage, 2004

Wöhe, G., Döring, U., Einführung in der Allgemeine Betriebswirtschaftslehre, Vahlen, 23. Auflage, 2008

Riedl, R., Roithmayr, F., Haider, B., Fallstudien zum Management von IT-Projekten, Trauner, 2006

### **Teaching and learning methods**

Seminar-style lesson

### **Type of examination**

Written exam, 90 - 120 min.

## **E4107 Business Leadership**

### **Content**

1. Character and Roles of Business Leaders
  - 1.1 Taking a position: what should be conveyed?
  - 1.2 The Entrepreneur according to Schumpeter
  - 1.3 Further development of the Schumpeter Concept through Heuss
  - 1.4 *Socioeconomic Epochs shape types of leaders according to Neuberger*
  - 1.5 Rahn identifies 9 types of leaders
  - 1.6 Theory: most businesses are overmanaged and undressed
  - 1.7 Increasing instability makes leadership more important than ever!
  - 1.8 The leader is a "coach"
  - 1.9 The realisation of three pillars leads to leadership
2. Corporate Responsibility (CSR)
  - 2.1 Theoretical Principles
  - 2.2 Status quo
  - 2.3 Advantages and disadvantages
3. Project: Marketplace / Infomarket
4. Integrative application of knowledge in business planning and in the responsibilities and methods of different functional areas of a business in a Business Plan Game, which will be conducted in teams
  - 4.1 Decisions on strategically positioning price and quality leadership

- 4.2 Make-or-Buy decisions
- 4.3 Implementing a strategic orientation in the decisions of various functional areas of a business
- 4.4 Coordinating decisions of various functional areas
- 4.5 Preparing results data for financial statement press conferences and shareholders' meeting presentations

### **Recommended literature**

Bea, F. X./Haas, J., Strategisches Management, 4. Aufl., Lucius und Lucius, Stuttgart, 2005

Brauweiler, H.-C., Unternehmensführung heute, Oldenbourg, München, 2008

Buß, E., Die deutschen Spitzenmanager ? Wie sie wurden, was sie sind, Oldenbourg, München, 2007

Coenenberg, A. G./Salfeld, R., Wertorientierte Unternehmensführung - Vom Strategieentwurf zur Implementierung, 2. Aufl., Schäffer-Poeschel, Stuttgart, 2007

Dillerup, R./Stoi, R. (Hrsg.), Praxis der Unternehmensführung, Vahlen, München, 2008

Giuliani, R. W. / Kurson, K., Leadership, Verantwortung in schwieriger Zeit, meine Prinzipien erfolgreicher Führung, C. Bertelsmann, München, 2002

Grant, R./Nippa, M., Strategisches Management, 5. Aufl. Pearson Studium, München, 2006

Marcharzina, K./Wolf J., Unternehmensführung, 5. Aufl., Gabler, Wiesbaden, 2005

Müller-Stewens, G./Lechner, C., Strategisches Management, 3. Aufl., Schäffer-Poeschel, Stuttgart, 2005

Peters, T. J./Waterman, R. H., Auf der Suche nach Spitzenleistungen - Was man von den bestgeführten US-Unternehmen lernen kann, Redline Wirtschaft (Moderne Industrie), Heidelberg, 2006

Schreyögg, G./Koch, J., Grundlagen des Managements, Gabler, Wiesbaden, 2007

Steinmann, H./Schreyögg, G., Management, 6. Aufl., Gabler, Wiesbaden, 2005

### **Admission requirements and recommended prerequisites**

Principles of Business Administration and Specific Business Administration

### **Teaching and learning methods**

Seminar-style lesson, group work, presentations, project: Marketplace / Infomarket

### Type of examination

Written certificate of achievement; written exam, 90 min.

## Module E-18 Business Intelligence

<b>Module name</b>	Business Intelligence
<b>Module no.</b>	E-18
<b>Module head</b>	Prof. Dr. Georg Herde
<b>Major field</b>	-
<b>Course number and course name</b>	E4102 Information Management E6102 Data Warehouse
<b>Instructors</b>	Prof. Dr. Georg Herde Prof. Dr. Dr. Heribert Popp Instructor Christian Dobler
<b>Semester</b>	4 - 6
<b>Length of module</b>	3 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 75 hours, 43 hours (bb) Virtual Teaching: 0 hours, 30 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

The module enables students to use a Data Warehouse (specifically SAP BW) as a flexible analysis tool as well as to develop a business reporting system for decision-making support in a company. It enables them to evaluate historic and current data in various levels of detail and from various perspectives over the web as well as in Microsoft Excel, as well as to create HTML pages with the BEx Web Application Designer.

The students have command of fundamental theories, models, concepts and methods of information and knowledge management and develop the capacity to apply them to practical problems.

They have an operative command of information retrieval in online Databases, on the internet and in SAP reporting systems. They can distinguish between pure reporting systems, expertise systems and EIS and have knowledge of the architecture of a data warehouse.

The students are familiar with the issues and influencing factors in the introduction of an ERP system. They know how to assess influencing factors of outsourcing and can carry out a risk analysis.

They are familiar with the process of implementing a knowledge management system.

## **E4102 Information Management**

### **Content**

1. Strategic Roles of Information Management
2. Management of Information\
  - 2.1 Process of information provision
  - 2.2 Online Databases
  - 2.3 Efficient use of search engines
  - 2.4 Reporting systems such as SAP Information System
  - 2.5 Business Intelligence
3. IT Resources
  - 3.1 Management of IT resources (IT staff, ERP software)
  - 3.2 Procurement of IT resources through (offshore) outsourcing
4. Risk Management in IT (levels of IT risk management, risk analyses, protection and defence mechanisms, catastrophe management)
5. Subprocesses of Knowledge Management
6. Methodological Support of Knowledge Management to Support Knowledge Transfer and the Representation of Knowledge
7. Valuation Methods in Knowledge Management

### **Recommended literature**

Lehner, Franz, Wissensmanagement, Hanser Verlag, München, 2006

Heinrich, Lutz J., Informationsmanagement: Planung, Überwachung und Steuerung der Informationsinfrastruktur. 7. Aufl., Oldenbourg, 680 S., München, 2002

Bellinger, Andrea, Krieger, David, Wissensmanagement für KMU, vdf Hochschulverlag AG, Zürich, 2007

Probst, G., Raub, S., Romhardt, K., Wissen managen - Wie Unternehmen ihre wertvollste Ressource optimal nutzen, Wiesbaden, 1997

Endres, A., Sind Outsourcing und Offshoring die neuen Heilmittel bei Informatik-Problemen, Informatik\_Spektrum 13. Dezember, S. 546-550, 2004

Meyer, Thomas, Stobbe, Antje, Offshoring- Welche Standorte wählen deutsche Unternehmen, Wirtschaftsinformatik 49, Sonderheft, S. S81-S89, 2007

### **Admission requirements and recommended prerequisites**

Knowledge from the modules Principles of Business Administration and Business Informatics are necessary. The entire lecture is available as a multimedia learning programme in order to prepare for each in-class lecture.

### **Teaching and learning methods**

Seminar-style lesson

E-learning

Groupwork

PC exercises

### **Type of examination**

Written exam, 75 min. and 15 min. online exam

## **E 6102 Data Warehouse**

### **Content**

1. Introduction to BW Reporting
  - 1.1 Overview of SAP BW
2. Navigation in Reports
  - 2.1 Navigation in reports
  - 2.2 BEx Browser
3. Business Content
  - 3.1 Working with Business Content Queries
4. Initial Steps in BEx Query Designer
  - 4.1 Query Designer
  - 4.2 InfoProviders and InfoObjects
5. Calculated and Restricted Key Figures
  - 5.1 Restricted key figures
  - 5.2 Calculated key figures
  - 5.3 Properties of key figures
6. Features
  - 6.1 Properties and attributes of features
  - 6.2 Integration of hierarchies in analysis
  - 6.3 Creating your own hierarchies
7. Variables
  - 7.1 Variable Wizard
8. Properties of Queries
  - 8.1 Properties of queries



- 8.2 Document integration
- 9. Exceptions and Conditions
  - 9.1 Exceptions
  - 9.2 Conditions
- 10. BEx Web Analyzer
  - 10.1 BEx Web Analyzer
- 11. Data Warehousing: Overview
  - 11.1 Basic Principles
  - 11.2 SAP Business Information Warehouse
- 12. The Multidimensional Model in SAP BW
  - 12.1 The Concept of SAP BW star schema
  - 12.2 Administrator Workbench (AWB) I
  - 12.3 InfoObjects
  - 12.4 InfoCube
  - 12.5 Technical implementation in SAP BW
- 13. Data Extraction from SAP Source Systems and Data Flows in SAP BW
  - 13.1 Administrator Workbench (AWB) II
  - 13.2 Loading master data (attributes, text, hierarchies)
  - 13.3 Loading transaction data
  - 13.4 Direct and flexible update

### **Recommended literature**

Gómez, J. Marx, Rautenstrauch, C., Cissek, Grahlher, B., Einführung in SAP Business Information Warehouse, Springer, Berlin, März 2006

Inmon, William H., Hackathorn, Richard D., Using the Data Warehouse, John Wiley & Sons, New York, 1994

Bauer, Andreas, Günzel, Holger, Data-Warehouse-Systeme: Architektur, Entwicklung, Anwendung, dpunkt, Heidelberg, 2009

Mehrwald, Christian, Datawarehousing mit SAP BW 3.5 - Architektur, Implementierung, Optimierung, dpunkt, Heidelberg, 2007

Jung, Reinhard, Winter, Robert, Data Warehousing Strategie, Springer Verlag, Berlin, 2000

### **Admission requirements and recommended prerequisites**

Basic knowledge of SAP

Databases

### **Type of examination**

Written exam, 90 - 120 min.

## Module E-19 Communication Technology

<b>Module name</b>	Communication Technology
<b>Module no.</b>	E-19
<b>Module head</b>	Prof. Dr. Horst Kunhardt
<b>Major field</b>	-
<b>Course number and course name</b>	E4103 Principles of Communication Technology E6103 Internetworking
<b>Instructors</b>	Prof. Dr. Horst Kunhardt Prof. Dr. Josef Schneeberger
<b>Semester</b>	4-6
<b>Length of module</b>	3 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 60 hours, 45 hours (bb) Virtual Teaching: 0 hours, 15 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

Participants in the module get a glimpse into the significance of communication technology for businesses and the economy. They understand the physical and technical fundamentals in developing and operating communications networks. The students become familiar with concepts, standards, norms, protocols, and technologies which are necessary for the planning, operation and further development of communications networks. Furthermore, they gain knowledge of the structure of local networks and the expansion of local networks using WAN technologies and routing. They gain knowledge and skills pertaining to network applications, network management and network security.

Participants gain a knowledge of communication technologies which are used in operating the internet, extranet or intranet. They understand the technical principles and underlying economic conditions necessary for the operation of a business network. They develop an awareness of security risks and performance problems and develop the ability to independently set up and operate important network components.

### E4103 Principles of Communication Technology

## Content

Modern businesses and national economies are highly dependent on the constant availability of information for their internal and external processes and demonstrate a high degree of interconnectivity. Communication systems are responsible for the transport of data between elements within a company as well as between elements of national economies. Thus, requirements based on given standards, economic perspectives, organizational and technical aspects as well as security aspects must be observed in the planning, operation and further development of networks.

The following topics will be discussed in detail:

1. General structure of communications systems
2. Development of communications systems using the Internet as an example
3. Transmission media (conductor and non-conductor)
4. Design of a structured cabling according to standard EN 50173-1
5. Principles of Asynchronous I/O
6. Principles of remote data transmission
7. Packet transmission and error detection
8. LAN technologies and network topology
9. Efficiency considerations in networks
10. Examples of network technologies (ethernet, fast ethernet, gigabit ethernet, ATM)
11. Hardware addressing and frame types
12. Active network components
13. WAN technologies, routing and the required protocols
14. Network applications and network management
15. Network security
16. Practical exercises using case studies serve to transfer the knowledge gained in the lectures into usable skills and competencies. Work in project teams, the presentation of solutions and discussing results help the students to develop skills necessary to meet the practical requirements in business settings.

## Recommended literature

Comer, D., Computer-Netzwerke und Internets, Prentice-Hall, 2003

Tanenbaum, A., Computernetzwerke, Prentice-Hall, 2003

Dye, M., McDonald, R., Ruff, A., Netzwerkgrundlagen - CCNA Exploration Companion Guide, Addison-Wesley, München, 2008

## Admission requirements and recommended prerequisites

University entrance qualification

## Teaching and learning methods

Seminar-style lessons

Practical exercises in the network lab

### **Type of examination**

Written exam, 60 min.

## **E6103 Internetworking**

### **Content**

1. Introduction to Routing and Packet Forwarding
  - 1.1 How a router works
  - 1.2 Routing tables
  - 1.3 Routing and switching
2. Static Routing
  - 2.1 Configuration of a router
  - 2.2 Static summary and default routes
3. Introduction to Dynamic Routing Protocols
  - 3.1 IGP and EGP
  - 3.2 Metrics in networks
  - 3.3 Administrative distance
4. Distance-Vector Routing Protocol
  - 4.1 Initialising a network
  - 4.2 Maintaining routing tables
  - 4.3 Detecting and avoiding routing loops
5. RIP
  - 5.1 RIPv1: A classful distance-vector protocol
  - 5.2 Subnetworks
  - 5.3 Default routes
6. VLSM and CIDR: Classful and classless addressing
7. RIP Version 2
  - 7.1 Differences between RIPv1 and RIPv2
  - 7.2 Configuring RIPv2
8. EIGRP
  - 8.1 The EIGRP protocol
  - 8.2 EIGRP router configuration
  - 8.3 EIGRP metric
9. Link-State Routing Protocol
10. OSPF
  - 10.1 The OSPF protocol
  - 10.2 OSPF router configuration
  - 10.3 The OSPF metric
  - 10.4 OSPF and multiple-access networks

Practical exercises using case studies serve to transfer the knowledge gained in the lectures into usable skills and competencies. Work in project teams, the presentation of solutions and discussing results help the students to develop the skills necessary to meet practical requirements in business settings.

### Recommended literature

Comer, D., Computer-Netzwerke und Internets, Prentice-Hall, 2003

Tanenbaum, A., Computernetzwerke, Prentice-Hall, 2003

Graziani, R., Johnson, A., Routing-Protokolle und -Konzepte - CCNA Exploration Companion Guide, Addison-Wesley, München, 2009

Badach, A., Hoffmann, E., Technik der IP-Netze. TCP/IP incl. IPv6, Funktionsweise, Protokolle und Dienste, Hanser Verlag, 2. Auflage, 2007

### Admission requirements and recommended prerequisites

Principles of Communication Technology

### Teaching and learning methods

Seminar-style lessons

Practical exercises in the network lab

### Type of examination

Written exam, 60 min.

### Module E-20 ERP Systems

<b>Module name</b>	ERP Systems
<b>Module no.</b>	E-20
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	E6104 ERP Systems
<b>Instructors</b>	Prof. Dr. Dieter Rummler Prof. Dr. Herbert Fischer Prof. Dr. Georg Herde Lecturer Wolfgang Stern
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 75 hours, 49 hours (bb) Virtual Teaching: 0 hours, 21 hours (bb) Independent Study: 105 hours, 110 hours (bb) Total: 180 hours

<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	E-02 Principles of Communication Technology E1105 Accounting E-08 Fundamentals of Business Informatics
<b>Teaching and learning methods</b>	Seminar-style lesson Virtual Learning Platform (iLearn) ERP System for Case Studies
<b>Further information</b>	Weighting: 2/5 Sales Distribution and Materials Management 2/5 Production Planning and Control 1/5 Financial Accounting and Controlling
<b>Type of examination</b>	Written exam 90-120 min

## Learning objectives

### Sales and Distribution and Materials Management

Participants in the module acquire a practical knowledge of the business administrative background as well as the application and design of an ERP System.

The focus is on reference processes in materials management and sales and distribution.

### Production Planning

Application and design of production planning as a link in the logistics chain. Through concrete PP systems, students will learn how the desired product is produced and distributed; from the sales plan to the planning process (production programme planning, primary requirements planning, material requirements planning), to managing manufacturing.

- Recognising process and data integration in logistics
- Understanding the application of an ERP system
- Understanding the significance of master data for the application
- Developing know-how of methods and approaches in production planning

### Financial Accounting and Controlling (SAP Modules FI and CO)

Introduction to the financial functional areas of SAP R/3, modules FI and CO

This module should enable the student to understand the significance of debtor and creditor posting procedures. He or she will develop an understanding of the correlation between cost entry in the financial area and its effects on controlling in a cost-relevant account assignment.

Understanding of the entry and maintenance of master data as well as carrying

out transaction postings in SAP R/3 is one of the objectives in this part of the course; however it is important to stress that the SAP R/3 is just one of many ERP systems. The student should develop the ability to differentiate between concrete activities in a system and the underlying theoretical principles.

## **Content**

Introduction to ERP Systems

### **Sales and Distribution and Materials Management**

1. Organisation of Materials Management
2. Master Data
3. Records
4. Organisation of Sales and Distribution
5. Master Data
6. Records
7. Procurement Processes

### **Production Planning and Control**

1. Changing Conditions
  - 1.1 The role of production planning
  - 1.2 Objectives of production planning
  - 1.3 Specific goals and objective
  - 1.4 Consistency of objectives
  - 1.5 Structural size
  - 1.6 Approaches to planning
  - 1.7 Database
  - 1.8 Redundancy
  - 1.9 Overview
  - 1.10 Cost structure
  - 1.11 Material master record
  - 1.12 Parts lists
  - 1.13 Work plans and steps
  - 1.14 Jobs
  - 1.15 MRP II
  - 1.16 Demand-driven material requirements planning
  - 1.17 Primary requirements
  - 1.18 Secondary requirements
  - 1.19 Material contribution margin accounting
  - 1.20 Case study: Material requirements planning
2. Consumption-based Material Requirements Planning
  - 2.1 Lot sizes
  - 2.2 Fixed period requirements
  - 2.3 Andler
  - 2.4 Least-unit-cost-method (LUC)
  - 2.5 Part-period method
  - 2.6 Problems: lot sizes
3. Production Control
  - 3.1 Order release

- 3.2 Sequence planning
- 3.3 Kanban
- 3.4 Load-oriented order release

- 4. SCM
- 5. Case Study: ERP System

### **Financial Accounting and Controlling (SAP Modules FI and CO)**

- 1. Utilising standard business software
- 2. Introduction to SAP software components
- 3. Interface and Operation of SAP Systems
- 4. The Module Accounting in SAP R/3
- 5. Organisational Elements in Financial Accounting
- 6. Creating Master Data
- 7. Creditors
- 8. Debtors
- 9. General Ledger Account
- 10. Mapping Simple Business Processes
- 11. Invoice Processing
- 12. Outgoing Invoice Processing
- 13. Balancing Open Items
- 14. Reporting Systems
- 15. Account Analysis
- 16. The Module Controlling in SAP R/3
- 17. Integration Aspects Between Accounting and Controlling
- 18. Overhead Cost Controlling
- 19. Cost-Type Accounting
- 20. Cost Centre Accounting
- 21. Cost Centre Planning
- 22. Reporting Systems
- 23. Cost Centre Overview

### **Recommended literature**

#### **Sales and Distribution and Materials Management**

Benz, J., Logistikprozesse mit SAP R/3, Vieweg, Braunschweig, 2008

Frick, D., Grundkurs SAP ERP, Vieweg, Braunschweig, 2008

Hellberg, T., Einkauf mit SAP MM. Prozesse, Funktionen, Customizing, Galileo Press, Bonn, 2009

Scheibler, J., Vertrieb mit SAP, Galileo Press, Bonn, 2009

#### **Production Planning and Control**

Goldratt, Eliyahu, M., Das Ziel, London u.a., McGraw-Hill, 1990

Kurbel, Karl, Produktionsplanung und -steuerung, München u.a., Oldenbourg, 2003



Bauer, Jürgen, Produktionscontrolling und -management mit SAP ERP, Wiesbaden, Vieweg + Teubner, 2009

Diffenderfer, Paul M., Microsoft Dynamics NAV, Wiesbaden, Vieweg + Teubner, 2008

Dangelmaier, Wilhelm, Theorie der Produktionsplanung und -steuerung, Berlin u.a., Springer, 2009

Grundzüge der Beschaffung, Produktion und Logistik, München u.a., Pearson Studium, 2009

Waters, C. Donald J., Supply chain management, Basingstoke u. a., Palgrave Macmillan, 2009

### Financial Accounting and Controlling

Maassen, A., Schoenen, M., Werr, I., Grundkurs SAP R/3, 3. Auflage, Vieweg Verlag, 2005

Gadatsch, A., Frick, D., SAP-gestütztes Rechnungswesen, 2. Auflage, Vieweg Verlag, 2005

Friedl, G., Hiltz, Ch., Pedell, B., Controlling mit SAP, 5. Auflage, Vieweg Verlag, 2008

Wenzel, P. (Hrsg.), Rechnungswesen mit SAP R/3, 1. Auflage, Vieweg Verlag, 2001

### Module E-21 Project Management

<b>Module name</b>	Project Management
<b>Module no.</b>	E-21
<b>Module head</b>	Prof. Dr. Michael Ponader
<b>Major field</b>	-
<b>Course number and course name</b>	E6106 Project Management
<b>Instructors</b>	Prof. Dr. Michael Ponader Prof. Andreas Kohl Prof. Dr. Herbert Fischer
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	3.0
<b>ECTS</b>	3.0
<b>Workload</b>	Class time: 45 hours Independent Study: 45 hours

	Total: 90 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Software Development
<b>Teaching and learning methods</b>	Seminar-style lesson Groupwork Presentations
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90-120 min Written certificate of achievement

## Learning objectives

The students gain a knowledge in the planning, monitoring and controlling of projects and in configuring the necessary organisational and operational structure. They apply this knowledge in teams through a practice-oriented software or organisation project.

## Content

### 1. Fundamentals

- 1.1 Recognise the characteristics of projects as opposed to line functions in a company as well as the demands on project managers and their responsibilities.
- 1.2 Project organization - illustration and discussion of various forms of responsibilities and competencies of other committees in a project organisation
- 1.3 Project planning and controlling - illustration of various types of project plans and their interdependence, approaches to project planning
- 1.4 Project phases - Presentation of select project phases, learning about the responsibilities and tasks in these phases
- 1.5 Technologies - introduction to and practicing the soft skills of a project manager (creativity techniques, moderation, presentation)
- 1.6 Develop knowledge in the use of software for project planning and

### 2. Completing a Practice-Oriented Software or Organisation Project in a Team:

- 2.1 Project requirements (requirements engineering)
- 2.2 Project planning
- 2.3 Project proposals
- 2.4 Project analysis
- 2.5 Product requirements document
- 2.6 Project design
- 2.7 Functional specifications document
- 2.8 Development of prototypes
- 2.9 User training and project conclusion

## Recommended literature

Verzuh, E., The Fast Forward MBA in Project Management, 3. Auflage, NJ, Wiley, Hoboken, 2008

Henrich, A., Management von SW-Projekten, 1. Auflage, Oldenbourg, München, 2002

Milosevic, D.Z., Project Management ToolBox - Tools and Techniques for the Practising Project Manager, 1. Auflage, Wiley, Hoboken, NJ, 2003

Project Management Institute (Hrsg.), A guide to the project management body of knowledge. PMBOK(R) Guide, 4. Auflage, Project Management Institute, Newtown Square, 2009

## Module E-22 Knowledge-Based Systems

<b>Module name</b>	Knowledge-Based Systems
<b>Module no.</b>	E-22
<b>Module head</b>	Prof. Dr. Heribert Popp
<b>Major field</b>	-
<b>Course number and course name</b>	E6108 Knowledge-Based Systems
<b>Instructors</b>	Prof. Dr. Heribert Popp Prof. Dr. Michael Ponader Prof. Dr. Josef Schneeberger
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 60 hours, 31 hours (bb) Independent Study: 120 hours, 124 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Knowledge from the module Mathematics as well as Information Management. The basic principles and the case studies are also available in a multimedia learning programme, so that the students can prepare for each in-class lecture.
<b>Teaching and learning methods</b>	Seminar-style lesson, E-learning, group work, PC exercises, case study work The online portion makes up 30% of the course; video contributions from specialists from universities and / or businesses
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90-120 min

### Learning objectives

The students have a good command of the fundamental theories, models,

concepts and methods of artificial intelligence. They are able to work in the programming language Prolog, and can use a Fuzzy-Shell and Neural Network Toolbox. They are familiar with knowledge management software systems. They are knowledgeable in expert systems in the areas of administration, material requirements planning and controlling. They can develop ontologies with a tool as well as programme agents.

### **Content**

1. Knowledge-Based Methods: an Overview
2. Fuzzy Technology in Business Administration
3. Neural Network Applications
4. Knowledge Management Software Tools
5. Knowledge Management Systems
6. How to Successfully Implement Knowledge Management
7. Expert Systems (Representation and Evaluation of Knowledge, Development, Application Examples, Checklist for a Selection of XPS Projects, Development Tools)
8. Case Based Reasoning
9. Collaborative Filtering
10. Intelligent User Modelling
11. Intelligent Agents (Environment, the Concept of Agents, Rationality, Agent System, Architectures, Reactive Architectures, Subsumption, Automatic Machines, Communication in Mult-Agent Systems (MAS), KQML, FIPA-ACL, Cooperation and Negotiation (in MAS))
12. Semantic Web
13. Ontologies

### **Recommended literature**

Görz, Günther, Rollinger, Claus-Rainer und Schneeberger, Josef, Handbuch der Künstlichen Intelligenz, Oldenbourg Verlag München, 3. Aufl., 2002

Russell, Stuart, Norvig, Peter, Artificial Intelligence: A Modern Approach, The Intelligent Agent Book, Prentice Hall, 2003

Lehner, Franz, Wissensmanagement, Hanser Verlag, München, 2006

Armutat, Sascha, u.a., Wissensmanagement erfolgreich einführen, DGFP, 2002

Kurbel, K., Entwicklung und Einsatz von Expertensystemen, Berlin, Heidelberg, New York, Tokyo, 1992

Mertens, P., Borkowski, V., Geis, W., Betriebliche Expertensystemanwendungen, Berlin, Heidelberg, New York, Tokyo, 1993

Stolpmann, M., Wess, Stefan, Optimierung der Kundenbeziehungen mit CBR-Systemen, Bonn u.a., 1999

Haun, Mathias, Wissensbasierte Systeme, expert Verlag, Renningen, 2000

Popp, H., Lödel, D., Fuzzy Techniques and User Modelling in Sales Assistants, in: User Modeling and User Adapted Interaction, 5, S. 349-370, 1995

Popp, H., Anwendungen der Fuzzy-Set-Theorie in Industrie- und Handelsbetrieben, Wirtschaftsinformatik, 1994

Popp, H., Protzel, P., Wallrafen, J., Mertens, P., Soft-Computing-Methoden für die Kreditwürdigkeitsprüfung, in: Kleinschmidt, P., Bachem, A., Derigs, U., Fischer, D., Leopold-Wildburger, U., Möhring, R. (Hrsg.), Operations Research Proceedings 1995, 305-310, 1996

### Module E-23 Web Management

<b>Module name</b>	Web Management
<b>Module no.</b>	E-23
<b>Module head</b>	Prof. Dr. Josef Schneeberger
<b>Major field</b>	-
<b>Course number and course name</b>	E6101 Content Management and Document Engineering E7104 Programming Multimedia Systems
<b>Instructors</b>	Prof. Dr. Michael Ponader Prof. Dr. Josef Schneeberger Prof. Andreas Kohl Lecturer Dr. Martin Heß
<b>Semester</b>	6 & 7
<b>Length of module</b>	2 semesters
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	8.0
<b>Workload</b>	Class time: 75 hours Independent Study: 165 hours Total: 240 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

The students gain knowledge and practical experience with standards, authoring languages and development systems for the implementation of multimedia applications. They develop an understanding of how to realise distributed application systems on the internet and of the practical implementation of multimedia elements in an integrated system. The participants receive training in

software development in a team and learn how to use patterns in programming.

They are familiar with and understand the key substantive, technical and organizational aspects of Web Content Management Systems.

## **E6106 Content Management and Document Engineering**

### **Content**

1. Content Management
  - 1.1 Concepts of web publishing - problems in conventional web publishing, difference between conventional web publishing and web publishing with a Web Content Management System (WCMS), definition of WCMS, distinction between WCMS and Document Management Systems.
  - 1.2 Web content - illustration of various content sources and their requirements with regard to editing processes and technologies; meaning; characteristics and forms; legal aspects and technical standards of content syndication; special content requirements in terms of internationalisation and search engines; contents of a style guide
  - 1.3 Functions of a WCMS - illustration of functions in the areas of asset management, work flow management, user and access management, import / export interfaces, illustration of various server concepts
  - 1.4 WCMS Implementation - Outline of the steps in the implementation of a WCMS from a content-based, aesthetic, organisational and technical perspective
  - 1.5 WCMS market - types of WCMS systems, pricing models, market overviews
  - 1.6 Practical work with WCMS systems

### **Recommended literature**

Nix, M., Web-Content-Management, 1. Auflage, Software und Support Verlag, Frankfurt, 2005

Zschau, O., Traub, D., Zahradka, R., Web Content Management - Websites professionell planen und betreiben, 2. Auflage, Galileo Press, Bonn, 2002

### **Admission requirements and recommended prerequisites**

Multimedia and Internet

### **Teaching and learning methods**

Seminar-style lesson, PC exercises

### **Type of examination**

Written exam, 90 - 120 min.

## **E7104 Programming Multimedia Systems**

### **Content**

1. Working in a team of programmers and system developers
2. Design and development of multimedia systems using a Help Authoring Tool
3. Creation of application-specific information units and connections between them, as well as the creation of interaction and navigation methods
4. Programming with servlets and JavaBeans and the necessary basic technologies for the development of a distributed multimedia application
5. Practical exercises in the application of internet standards and languages (XML, XSLT)
6. Realisation of a software system on the basis of a persistence technology
7. System conception and programming using an application server
8. The focus of this course is on practical work on the computer. Application projects developed using modern software systems (both in terms of development tools and the server components used) will be carried out in teams.

### **Recommended literature**

Oates, R., Langer, T., Wille, S., Lueckow, T., Bachlmayr, G., Spring & Hibernate - eine praxisbezogene Einführung, Hanser Verlag, 2008.

Bauer, C., King, G., Java-Persistence mit Hibernate, Hanser Verlag 2007

Hennebrüder, S. , Hibernate, Das Praxisbuch für Entwickler, Galileo Computing, 2007

Breidenbach, R., Walls, C., Spring im Einsatz, Hanser Verlag, 2008

### **Admission requirements and recommended prerequisites**

Principles of Software Development

### **Teaching and learning methods**

Seminar-style lesson

Practical software development in a team

Presentation of results in the form of a system presentation of the developed programme

### **Type of examination**

written exam, 90 min.

## Module E-24 E- and M-Business

<b>Module name</b>	E- and M-Business
<b>Module no.</b>	E-24
<b>Module head</b>	Prof. Dr. Heribert Popp
<b>Major field</b>	-
<b>Course number and course name</b>	E7101 E- and M-Business
<b>Instructors</b>	Prof. Dr. Heribert Popp Prof. Andreas Kohl
<b>Semester</b>	7
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 60 hours, 52 hours (bb) Virtual teaching: 0 hours, 8 hours (bb) Independent Study: 120 hours, 120 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Knowledge from the modules Multimedia and Internet as well as Information and Knowledge Management. Some sections of the lecture are available as a multimedia learning programme, so that students can prepare for the in-class lectures.
<b>Teaching and learning methods</b>	Seminar-style lesson E-learning Group work PC Exercises Project work in groups
<b>Further information</b>	The online portion accounts for 15%; Video contributions from specialists from universities and / or businesses
<b>Type of examination</b>	written assignment

### Learning objectives

Students have a good command of theories, models, concepts and methods of e-business and m-business and can apply them to practical problems.

They are familiar with electronic advisory systems and can develop such systems for concrete businesses. They are familiar with the problems and influencing factors in the introduction of e-business systems and can design complete systems.

They are familiar with the process of search engine marketing. They can develop m-business solutions for concrete applications in various departments.



## Content

1. The Internet Market (Statistics, Web 2, business models for e-business, project management in e-business)
2. Technological Fundamentals of e-business
  - 2.1 Security issues in new media
  - 2.2 Mobile internet
  - 2.3 Electronic (mobile) methods of payment
  - 2.4 Overview of technologies for the implementation of e-business
  - 2.5 Software systems for e-business
  - 2.6 Connecting standard business software to the internet
  - 2.7 Portals, in particular Microsoft SharePoint Server
3. E-Commerce in B to C
  - 3.1 Shops, malls, virtual marketplaces and portals
  - 3.2 Electronic advising
  - 3.3 e-marketing
  - 3.4 Electronic customer relationship management
  - 3.5 Selected key branches: e-business in tourism
4. E-procurement and e-distribution
5. Business / Consumer-to-Administration Transaction Processing
6. RFID: Functioning and Applications
7. Search Engine Technologies and Search Engine Marketing

## Recommended literature

Stahl, Ernst, Krabichler, Thomas, Breitschaft, Markus, Wittmann, Georg, E-Commerce-Leitfaden - Erfolgreicher im elektronischen Handel. 2. Aufl. ibi research an der Universität Regensburg GmbH, 2009

Bieger, Th. et al., Zukünftige Geschäftsmodelle, Berlin, 2002

Lehner, Franz, Mobile und drahtlose Informationssysteme, Springer, 2002

Dohmann, H., Fuchs, G., Khakzar, K., Die Praxis des E-Business, Vieweg Verlag, 2002

Meier, A., Stormer, H., eBusiness eServices, Springer, 2005

Heinemann, F., Rau, C., SAP Web Application Server, Bonn, 2004

Bagusat, Ariane, Hermanns, Arnold, E-Marketing Management, Vahlen, 2008

Mertens, P., Breuker, J., Lödel, D., Ponader, M., Popp, H., Thesmann, S., Angebotsunterstützungssysteme für Standardprodukte, in: Informatik-Spektrum, 17, 5 S. 291-301, 1994

Popp, H., Lödel, D., Fuzzy Techniques and User Modelling in Sales Assistants, in: User Modeling and User Adapted Interaction, 5; 3-4, S. 349-370, 1995

Geist, Marc-Rene, Popp, H., Virtual Reality (VR), Anwendungssysteme zur Verkaufsunterstützung, in: Wirtschaftsinformatik 40, 1, S. 33-38, 1998

Popp, Heribert, E-Learning-System bedient die verschiedenen Lernertypen eines betriebswirtschaftlichen Fachbereichs: Didaktik, Realisierungstechnik und Evalua-

tion. In Seiler-Schiedt, Eva, Kälin, Siglinde, Sengstag, Christian (Hrsg.): E-Learning, alltagstaugliche Innovation, Waxman-Verlag, S. 141-151, 2006

Popp, Heribert, Huber, Eckhard, Steigerung des Humankapitals in KMUs durch virtuelle Weiterbildung, bei der sich E-Learning-Systeme an die Benutzer anpassen. In Krieger, David, Bellinger, Andrea (Hrsg.), Wissensmanagement für KMU, Zürich, S. 219-236, 2006

Popp, H., Herde, G., Adressatenorientierte Adaptivität und Wirtschaftlichkeit im IT-Kompaktkurs. In Breitner, M., Hoppe, G. (Hrsg.), E-Learning - Einsatzkonzepte und Geschäftsmodelle, Physica-Verlag, S. 431-441, 2005

## Module E-25 Internet Marketing and User Interface Design

<b>Module name</b>	Internet Marketing and User Interface Design
<b>Module no.</b>	E-25
<b>Module head</b>	Prof. Dr. Michael Ponader
<b>Major field</b>	-
<b>Course number and course name</b>	E7102 Internet Marketing and User Interface Design
<b>Instructors</b>	Prof. Dr. Michael Ponader Lecturer Christian Bauer
<b>Semester</b>	7
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	3.0
<b>ECTS</b>	4.0
<b>Workload</b>	Class time: 45 hours Independent Study: 75 hours Total: 120 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Multimedia and Internet
<b>Teaching and learning methods</b>	Seminar-style lesson, case studies, group work, presentations
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90 min

### Learning objectives

In this module participants learn methods of planning and developing e-business systems as well as opportunities for applying internet technology in the area of customer care. They learn about the correlation between online and offline marketing as well as the concepts, content and methods of user interface design and can apply some of them in practice. Students are able to formulate requirements in the design of a user interface and can evaluate draft designs.

## Content

### Internet Marketing

1. E-business - concepts, types and factors of success
2. Evaluation / prioritising e-business projects in a company
3. Market research on the internet / about the internet
4. Selected aspects of distribution policy (e.g. affiliate programmes, strategies for producers to avoid channel conflicts) and contracting policy (e.g. Possibilities for price differentiation, pricing mechanisms) on the internet
5. Introduction to and discussion of possibilities for offering value added in comparison to regular media and sales channels in the areas of pre-sales, sales and after-sales
6. E-commerce user experience: selection and presentation of usability guidelines for online shops
7. Conducting a competitor analysis and developing a rough concept for an e-commerce proposal through team work

### User Interface Design

1. User interface design - definition, types, impacts and goal setting, best practice examples
2. Design grid introduction
  - 2.1 Grid systems in web design, constructing a grid
  - 2.2 Design elements, constants - definition and discussion of examples
  - 2.3 Introduction to design laws, point / line / area - the interplay of
3. Colour Schemes
  - 3.1 Introduction to colour theory
  - 3.2 Harmony and disharmony in colour combinations: Introduction and discussion of best practice examples
  - 3.3 HSL colour space
  - 3.4 Visual representation and imagery - definition and discussion of examples of application
  - 3.5 Pictogrammes
4. Introduction to Typography
  - 4.1 Font types - origin, print vs. non-print
  - 4.2 Text design - function and form, arrangements
5. Composition
  - 5.1 Screen layouts - introduction and discussion of best practice examples
  - 5.2 Introduction to and discussion of navigation concepts
  - 5.3 Dialogue elements, forms, multi-level user dialogue
6. Introduction to Adobe Photoshop with exercises

### Recommended literature

Booz, Allen & Hamilton (Hrsg.), 10 Erfolgsfaktoren im e-business, 2. Auflage, FAZ- Institut für Management-, Markt- und Medieninformationen, Frankfurt, 2001

Chaffey, D., Mayer, R., Johnston, K., Ellis-Chadwick, F., Internet-Marketing, 2. Auflage, Prentice Hall/Financial Times, Harlow u.a., 2009

Müller, A., Thienen, L., e-Profit: Controlling-Instrumente für erfolgreiches e-Business, 1. Auflage, Haufe, Freiburg u.a., 2001

Nielsen, J., E-commerce user experience, 1. Auflage, Nielsen Norman Group, Fremont, Calif., 2001

Stolpmann, M., Kundenbindung im E-Business, 1. Auflage, Galileo Press, Bonn, 2000

Stolpmann, M., Service und Support im Internet, 1. Auflage, Galileo Press, Bonn, 2001

Warschburger, V., Jost, C., Nachhaltig erfolgreiches E-Marketing, 1. Auflage, Vieweg, Braunschweig u.a., 2001

Maxbauer, Andreas und Regina, Praxishandbuch Gestaltungsraster - Ordnung ist das halbe Lesen, 2. Auflage, Hermann Schmidt, Mainz, 2003

Friedl, Friedrich, Ott, Nicolaus, Stein, Bernard, (Hrsg.), Typography - when, who, how, Könemann, 1. Auflage, Köln, 1998

Götz, Veruschka, Raster für das Webdesign, Rowohlt Taschenbuch Verlag, 1. Auflage, Reinbek bei Hamburg, 2002

Khazaeli, Cyrus Dominik, Systemisches Design - Intelligente Oberflächen für Information und Interaktion, deutsche Erstausgabe, Rowohlt Taschenbuch Verlag, 1. Auflage, Reinbek bei Hamburg, 2005

Küppers, Harald, Das Grundgesetz der Farben, 10. Auflage, DuMont Buchverlag, Köln, 2004

Küppers, Harald, Harmonielehre der Farben - Theoretische Grundlagen der Farbgestaltung, 3. Auflage, DuMont Buchverlag, Köln, 2000

Küppers Harald, Schule der Farben - Grundzüge der Farbentheorie für Computeranwender und andere, 2. Auflage, DuMont Verlag, Köln, 2001

Ruder, Emil, Typographie, 7. Auflage, Verlag Niggli, Sulgen, Schweiz, 2001

Müller-Brockmann, Josef, Grid Systems in Graphic Design, 4. Auflage, Verlag Niggli, Sulgen, Schweiz, 1996

Cooper, Alan, About Face - The Essential of Interaction Design, 1. Auflage, Wiley Publishing, Indianapolis, USA, 2007

Beer, Günther (Hrsg.), web design index 7, The Pepin Press, 1. Auflage, Amsterdam, 2007

## Module E-26 Business and IT Law

<b>Module name</b>	Business and IT Law
<b>Module no.</b>	E-26
<b>Module head</b>	Prof. Dr. Josef Scherer
<b>Major field</b>	-
<b>Course number and course name</b>	E6107 Business and IT Law
<b>Instructors</b>	Prof. Dr. Josef Scherer Lecturer: the Honourable Stefan Felixberger, Judge at the regional court
<b>Semester</b>	7
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	3.0
<b>ECTS</b>	3.0
<b>Workload</b>	Class time: 45 hours, 30 hours (bb) Virtual learning: 0 hours, 15 hours (bb) Independent Study: 45 hours, 45 hours (bb) Total: 90 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	Seminar-style lecture Occasionally guest lectures on specialized practices in the context of risk and compliance management
<b>Further information</b>	-
<b>Type of examination</b>	Written exam 90-120 min

### Learning objectives

The students are familiar with the prophylactic methods of risk and compliance management. They have been introduced to the legal norms of the relevant areas of civil law, multimedia law and data protection law which are most important for a business economist. They develop the ability to recognize legal problems in these areas and to solve simple cases in professional practice. Graduates have developed an awareness of the business administrative and legal requirements in a legally-secure business organisation.

### Content

#### Key Features of Risk and Compliance Management

2. Key Features of Contract Management
3. Key Features of Legal Guidelines of the HGB (German Commercial Code) and the Rights of Private Companies and Incorporated Companies

4. Key Features of Employer Liability Law (Business Manager Compliance)
5. Key Features of Data Protection Law and Internet and Multimedia Law (Cyber Law); in particular contract types in the IT sector (Contract types for standard and custom hardware; standard and custom software), maintenance contracts, online contracts, mailbox contracts, copyright law for computer programmes and Databases, commercial legal protection as well as computer criminal law

### Recommended literature

Scherer, Fruth (Hrsg.), Geschäftsführer-Compliance, Praxiswissen zu Pflichten, Haftungsrisiken und Vermeidungsstrategien, Schmidt-Verlag, Berlin, 2009

Scherer, Mühlbauer, Unterwiener u. a., Den Rücken frei: No risk, much fun! Praxiswissen Risikomanagement und Compliancemanagement, rtw medien, Deggendorf, 2007

Scherer, Friedrich, Schmieder, Koller, Hagenbuchner, Scholz, Weidinger, Verträge - Praxiswissen Vertragsmanagement, rtw medien, Deggendorf, 2005

### Module E-27 Practical Experience

<b>Module name</b>	Practical Experience
<b>Module no.</b>	E-27
<b>Module head</b>	Prof. Dr. Herbert Fischer
<b>Major field</b>	-
<b>Course number and course name</b>	E5112 Practice-Accompanying Course 2 E5111 Practice-Accompanying Course 1 E5100 Internship
<b>Instructors</b>	Prof. Dr. Herbert Fischer Prof. Dr. Dieter Rummler Prof. Dr. Josef Schneeberger Prof. Dr. Heribert Popp Lecturer Wolfgang Stern
<b>Semester</b>	5
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	4.0
<b>ECTS</b>	30.0
<b>Workload</b>	Class time: 60 hours, 30 hours (bb) Virtual learning: 0 hours, 30 hours (bb) Independent Study: 840 hours, 840 hours (bb) Total: 900 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Entrance into the practical semester requires the completion of at least 90 ECTS credit

	points. (According to § 7 of the Study and Examination Regulations for the Bachelor Programme Business Informatics)
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### **Learning objectives**

The general goal of the module is to give the students the opportunity to apply the knowledge they have gained in practice and at the same time, to become familiar with the operational processes in a company. Furthermore, the practical semester offers participants the opportunity to improve their cooperation and communication skills through presenting the results they have achieved.

## **E5100 Internship**

### **Learning objectives**

Participants gain an overview of the functioning ad processes in a company and a glimpse into the complexity of business administrative operations. They can deepen and expand upon the specialized knowledge they have gained through experience with practical applications. Depending on the area of the internship, the student will be working in the conception, consulting, design, and optimisation of IT solutions in production, commercial, and service companies; administrative operations and software and consulting firms and utilises modern software tools. The students become familiar with current working procedures for solving problems in the area of business informatics and know how to implement them effectively. In the professional working field as a business informatics specialist, he or she is able to collaborate and independently work on concrete tasks which shape and control business processes, and thus gain problem solving competencies.

### **Content**

The student should be placed in two of the following working areas, when possible:

1. Development, maintenance, adaptation and implementation of application software for business administrative areas
2. Selection, implementation and adaptation of methods, procedures and systems to solve commercial problems using IT tools
3. Preparing for the implementation of computers in companies as well as in relevant departments; including an analysis of user requirements, follow-up with users, developing and carrying out user training sessions
4. Planning, preparing for and carrying out changes to existing operational processes which occur as a result of the implementation of information technology

5. Analysis of the current state in a business operational area, compiling a list of the necessary technical and content-related software requirements, developing requirements profiles, testing and selecting suitable IT solutions and standard software available on the market
6. Conducting a market study and a detail study of specific products; designing and programming customised IT solutions tailored to the specific requirements of the user.
7. Sales of hardware and software products, customer / user support and consulting related to suitable system configurations, their planning, implementation and utilisation
8. Advising users in the case of technical difficulties or application issues
9. The minimum internship duration with the company may not be less than 18 full weeks. In combination with the two Practice Accompanying Block-Week courses, the minimum internship duration is 20 weeks (according to §2 Abs. paragraph 2 of the RaPo, State Examination Regulations). In specific cases, it is possible to shorten the internship duration. (e.g. in the case of a completed professional apprenticeship)
10. In the extra-occupational study programme, there is a project in the module FI (finance) using SAP R/3

The Internship can also be completed abroad.

### **Teaching and learning methods**

Practical tasks in a company. Upon successful participation, the internship will receive a "pass" grade.

The successful participation will be confirmed by the company in the form of a Letter of Reference, and the students must submit a written internship report. Successfully completed reports will also receive a "pass" grade.

### **Type of examination**

Letter of Reference

Internship Report

## **E5111 Practice-Accompanying Course 1**

### **Learning objectives**

Through the combination of theory and practice, participants broaden the knowledge gained in the conception, counselling, design and optimisation of IV solutions using software tools in production, commercial and service companies; administrative entities; and software and consulting firms. They reflect on their practical experiences.

### **Content**



During the practical semester, the University runs practice-accompanying courses. These are offered in the form of block-week courses. The practice-accompanying course weeks are offered at the end of the winter semester and the end of the summer semester (dates posted on the internet). There is an exam at the end of each practice-accompanying course.

### **Recommended literature**

Please refer to the description in the syllabus of the current practice accompanying course.

### **Teaching and learning methods**

Report, seminar lectures

### **Type of examination**

Written assignment

## **E5112 Practice-Accompanying Course 2**

### **Learning objectives**

Through the combination of theory and practice, participants broaden the knowledge gained in the conception, counselling, design and optimisation of IV solutions using software tools in production, commercial and service companies; administrative entities; and software and consulting firms. They reflect on their practical experiences.

### **Content**

During the practical semester, the University runs practice-accompanying courses. These are offered in the form of block-week courses. The practice-accompanying course weeks are offered at the end of the winter semester and the end of the summer semester (dates posted on the internet). There is an exam at the end of each practice-accompanying course.

### **Recommended literature**

Please refer to the description in the syllabus of the current practice-accompanying course.

### **Teaching and learning methods**

Report, seminar lectures

### **Type of examination**

Written assignment

## Module E-28 Bachelor's Thesis

<b>Module name</b>	Bachelor's Thesis
<b>Module no.</b>	E-28
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	E7100 Bachelor's Thesis
<b>Instructor</b>	Prof. Dr. Dieter Rummler
<b>Semester</b>	7
<b>Length of module</b>	1 semester
<b>Module frequency</b>	annually
<b>Status in curriculum</b>	mandatory
<b>Level</b>	Bachelor
<b>SWS</b>	0.0
<b>ECTS</b>	12.0
<b>Workload</b>	Independent Study: 360 hours Total: 360 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	According to §12 of the Study and Examination Regulations, students may be admitted to the bachelor's thesis upon completing a minimum of 120 ECTS credit points.
<b>Teaching and learning methods</b>	The bachelor's thesis may be written in either English or German, based on the agreement with the Examiner.
<b>Further information</b>	The bachelor's thesis is to be written according to the requirements of the Examination Framework (RaPO) and the General Examination Requirements of the Deggendorf Institute of Technology (APO).
<b>Type of examination</b>	Written work

### Learning objectives

In the Bachelor's Thesis, students should demonstrate their ability to independently apply the knowledge and skills they have gained to complex tasks and to present them in the appropriate written form. In doing so, students show that they have successfully completed the B.A. programme and have acquired the skills necessary to perform independent scientific work.

### Content

The Bachelor's Thesis is a written research project. It will be assigned, supervised and evaluated by a qualified person from the programme of study (professor, instructor). The student can suggest topics.

The thesis normally takes 3 months to complete; however, a maximum of 5 months may be taken from the date of assignment to the date of submission according to §11 APO (General Examination Regulations). The length should generally not exceed more than 40 pages. The Bachelor's Thesis can be written on any topic related to one of the modules of the programme.

### Recommended literature

The thesis must include a complete list of literature cited, interviews and other sources. In terms of the formal requirements and formatting, the following should be used as a reference:

Lück, Wolfgang, Technik des wissenschaftlichen Arbeitens, 4. Auflage, Oldenbourg, München, Seite 10 ff, 2009

### Module E-29 Development of Business Processes

<b>Module name</b>	Development of Business Processes
<b>Module no.</b>	E-29
<b>Module head</b>	Prof. Dr. Dieter Rummler
<b>Major field</b>	-
<b>Course number and course name</b>	E6110 Work Flow Systems E6103 Advanced Techniques of ERP Programming E6110 Work-Flow Systems
<b>Instructors</b>	Prof. Dr. Dieter Rummler
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	semi-annually
<b>Status in curriculum</b>	Specialised Mandatory Elective Subject
<b>Level</b>	-
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 75 hours Independent Study: 105 hours Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	SAP Practice Accompanying Course week, Databases / SQL, Fundamentals of ERP Programming
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-
<b>Type of examination</b>	-

### Learning objectives

The students understand that business process optimisation is crucial and that a workflow can only be achieved using technology. They understand the

significance of workflow in a Service Oriented Architecture and are familiar with the interplay of an ERP system, business objects and workflow. They know when programming, groupware and when workflow should be implemented. The participants are aware of the advantages of workflow and its requirements for implementation and grasp the interplay between organization units / established job posts and with workflow addressees. They can conceive and realise concrete workflows. They are familiar with the advantages of digital data (scanning, converting into .tiff format, archiving, electronic data transfer) as opposed to paper information.

The course Advanced Techniques of ERP Programming builds on the foundational course Fundamentals of ERP Programming (report programming, database access, encapsulation of programme code). Building on this, professional programmes in the ERP field should be developed. How can performance be optimised in mass data processing? How can programmes be tested efficiently? What do new, cutting-edge technologies look like? Object oriented concepts and web programming should be realised within a Service Oriented Architecture.

## **E6103 Advanced Techniques of ERP Programming**

### **Content**

1. ERP and databases
2. SQL trace
3. Buffering
4. Indices
5. Database lock
6. Monitoring performance
7. Deadlocks
8. Transactions
9. Generating and calling up Stored Procedures
10. Performance optimisation
11. Object Orientation
12. Pointer
13. Data objects
14. Instances / classes
15. Input forms
16. Showing table data
17. Showing list data
18. Changing Data
19. Custom programming in standard software
20. Web programming
21. Business server pages
22. Web Dynpros
23. Generating and calling up web services from foreign systems

### **Recommended literature**

Keller, Horst, ABAP objects, Bonn u. a., Galileo Press, 2008

Profikurs ABAP, Wiesbaden, Vieweg, 2007

Hoffmann, Ulli, Praxisbuch Web Dynpro for ABAP, Bonn, Galileo Press, 2006

### **Teaching and learning methods**

Seminar-style lesson

### **Type of examination**

Written exam, 60 min.

## **E6110 Workflow Systems**

### **Content**

- Workflow customising
- Workflow development environment
- Business processes and workflow
- Setting up abstract workflow addressees
- Organisational units
- Posts
- Rules of dynamic allocation
- Setting up a workflow EPC
- Data flows in workflow
- Workflow from the user perspective
- Inbox processing
- Setting up and activating a substitute
- Workflow from the programming perspective
- Business objects
- Attributes
- Methods
- Events
- Test tools
- Triggering workflow events in an ERP system
- Workflow from the controlling perspective
- Troubleshooting runtime errors
- Protocols
- Realising a complex workflow
- Business object
- Workflow steps
- Workflow with multiple steps
- Triggering ERP events

### **Recommended literature**

Keller, Horst, ABAP objects, Galileo Press, Bonn u. a., 2008

Heck, Rinaldo, Geschäftsprozessorientiertes Dokumentenmanagement mit SAP, Bonn, Galileo Press, Bonn, 2009

Mende, Ulrich, Workflow und ArchiveLink mit SAP, dpunkt-Verl., Heidelberg, 2004

Workflow-Management mit SAP, Galileo Press, Bonn, 2006

Berthold, Andreas, SAP Business Workflow, Addison-Wesley, München u. a., 1999

McMenamin/Palmer: Strukturierte Systemanalyse, Hanser u. a., München u. a., 1988

### Teaching and learning methods

Seminar-style lesson, lab exercises with concrete ERP systems

### Type of examination

Written exam, 60 min.

## Module E-30 IT Security and Controlling

<b>Module name</b>	IT Security and Controlling
<b>Module no.</b>	E-30
<b>Module head</b>	Prof. Dr. Horst Kunhardt
<b>Major field</b>	-
<b>Course number and course name</b>	E6105 IT Controlling E6111 IT Security
<b>Instructors</b>	Prof. Dr. Horst Kunhardt Prof. Dr. Michael Ponader
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	semi-annually
<b>Status in curriculum</b>	Specialised Mandatory Elective Subject
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 75 hours, 56 hours (bb) Virtual Learning: 0 hours, 14 hours (bb) Independent Study: 105 hours, 110 hours (bb) Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	-
<b>Teaching and learning methods</b>	-
<b>Further information</b>	-

<b>Type of examination</b>	-
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## **E6105 IT Controlling**

### **Learning objectives**

Participants understand the role of IT controlling and learn about the methods and their application for selected areas of IT controlling. They are able to evaluate the advantages and disadvantages of alternative methods and procedures.

### **Content**

1. Strategic IT Planning
  - 1.1 Procedures for deriving strategically relevant IT projects
  - 1.2 Criteria and procedures for prioritising IT projects
  - 1.3 Structural and procedural organization for IT portfolio management
2. Profitability of IT Systems
  - 2.1 Requirements for profitability study
  - 2.2 Various procedures for conducting a profitability study
3. Tender for IT Services
  - 3.1 Tender process for IT services
  - 3.2 Structure and content of calls for tender
  - 3.3 Procedures for rating offers
4. Cost Calculation in IT
  - 4.1 IT-related principles of cost calculation
  - 4.2 Total cost of ownership
  - 4.3 Activity-based costing
5. Cost Allocation between IT and Technical Departments
  - 5.1 Requirements of a cost allocation
  - 5.2 Product formation for a cost allocation
  - 5.3 Various procedures in cost allocation
6. Performance Indicators in IT
  - 6.1 Performance indicators for selected areas of internal IT
  - 6.2 Indicator system
  - 6.3 Balanced Scorecard as a comprehensive indicator system

### **Recommended literature**

Friedag, Herwig, u. a., My Balanced Scorecard, 1. Auflage, Haufe, Freiburg u.a., 2001

Gadatsch, A., Mayer, E., Masterkurs IT-Controlling, 3. Auflage, Vieweg, Wiesbaden, 2006

Kargl, H., DV-Controlling, 4. Auflage, Oldenbourg, München u.a., 1999

Kütz, M., IT-Controlling für die Praxis, 1. Auflage, Dpunkt, Heidelberg, 2005

Kütz, M., Kennzahlen in der IT, 3. Auflage, Dpunkt, Heidelberg, 2007

Milosevic, D.Z., Project Management ToolBox - Tools and Techniques for the Practicing Project Manager, 1. Auflage, Wiley, Hoboken, NJ, 2003

Müller, A., Thienen, L., e-Profit: Controlling-Instrumente für erfolgreiches e-Business, 1. Auflage, Haufe, Freiburg u.a., 2001

Schriftenreihe der Koordinierungs- und Beratungsstelle der Bundesregierung für Informationstechnik in der Bundesverwaltung (KBSt), Empfehlung zur Durchführung von Wirtschaftlichkeitsbetrachtungen in der Bundesverwaltung, insb. beim Einsatz der IT, Version 4.1, Band 92, Januar 2007

Schriftenreihe der Koordinierungs- und Beratungsstelle der Bundesregierung für Informationstechnik in der Bundesverwaltung (KBSt), Unterlage für Ausschreibung und Bewertung von IT-Leistungen IV, Version 1, Band 90, November 2006

### **Admission requirements and recommended prerequisites**

Information Management

Finance and Investment

### **Teaching and learning methods**

Seminar-style lesson, case studies, group work

### **Type of examination**

written exam, 90 - 120 min.

## **E6111 Information Security**

### **Learning objectives**

The students gain knowledge and competencies in the application of methods for determining and meeting the security needs of organisations. Concepts of IT Security, from security models and their implementation and monitoring in a company to current developments, will be taught through case studies. Students will gain an understanding of the significance of IT security for the processes in a company with regard to risk and compliance management.

- Students understand the terms "security" and "safety" and the difference between them, and learn about other dimensions of information security.
- The legal requirements, particularly §202 of the StGB (German Criminal Code), will be discussed critically, in order to provide the students with concrete recommendations for acting in their later professional roles.
- Threats from the internet and their perpetrators will be classified and assessed



according to relevance.

- The students become familiar with Security Engineering based on the IT-Grundschutz of the BSI (Federal Office for Information Security) and can apply it to various predefined scenarios.
- Various security models and architectures will be compared and contrasted and identified through case studies of each underlying model.
- The methodology of IT Risk Management will be applied through case studies and will be taught in conjunction with IT Compliance as well as existing standards such as ITIL CoBIT.
- The students will be able to critically evaluate economic, societal and ethical trends relating to data protection, data security and compliance.

## **Content**

1. Motivation and Introduction
2. General Principles and Concepts
  - 2.1 Legal requirements
  - 2.2 Protection objectives
3. Threats to Information Security
  - 3.1 Types of attack
  - 3.2 Security gaps
  - 3.3 Malware
  - 3.4 Internal threats, violations and fraud
  - 3.5 Threat potential of innovative technologies
4. Security Engineering
  - 4.1 IT-Grundschutz (Basic IT Protection) Handbook of the BSI (Federal Office for Information Security)
  - 4.2 Organisational integration of information security
5. Assessment Criteria of Information Security
  - 5.1 TCSEC criteria
  - 5.2 ITSEC criteria
6. Security Models and Architectures
  - 6.1 Access control models
  - 6.2 Role-based models
  - 6.3 Bell-LaPadula model
  - 6.4 Biba model
  - 6.5 Clark-Wilson model
  - 6.6 Lattice-based model
  - 6.7 Overview and summary of security models
7. IT Risk Management
  - 7.1 Classification and de-classification of data
  - 7.2 IT Risk assessment using case studies
  - 7.3 Human resource management
8. Trends and Further Developments in IT Security
  - 8.1 Economic and societal trends
  - 8.2 Technical developments
  - 8.3 Legal trends
  - 8.4 Ethical and social aspects
9. Further Links and Literature

## 10. Case Studies

### **Recommended literature**

Carus, M., Ethical Hacking, Software & Support Verlag GmbH, Unterhaching, 2008  
Eckert, C., IT-Sicherheit, Oldenbourg, München, Wien, 2. Auflage, 2003

Meyers, M., Harris, S., CISSP Certified Information Systems Security Professional, mitp-Verlag, Bonn, 2003

### **Web links**

Federal Office for Information Security - [www.bsi.bund.de/EN/](http://www.bsi.bund.de/EN/)

IT-Audit - [www.it-audit.de](http://www.it-audit.de)

Antivirus Online - [www.antivirus-online.de](http://www.antivirus-online.de)  
Computerbetrug - [www.computerbetrug.de](http://www.computerbetrug.de)

Heise Security - [www.heise.de/security](http://www.heise.de/security)  
Sicherheit im Internet - [www.sicherheit-im-internet.de](http://www.sicherheit-im-internet.de)

RiskNet - [//www.risknet.de/en/](http://www.risknet.de/en/)

### **Admission requirements and recommended prerequisites**

Knowledge of correlations and structures from the lectures on Operating Systems and Network Technology.

### **Teaching and learning methods**

Overview lectures, presentations, discussions and workshops, teamwork, seminar-style lesson, IT-supported learning

### **Type of examination**

Written or oral exam or written assignment or student work

## Module E-31 IT Compliance & Audit and Monitoring

<b>Module name</b>	Compliance & Audit and Monitoring
<b>Module no.</b>	E-31
<b>Module head</b>	Prof. Dr. Georg Herde
<b>Major field</b>	-
<b>Course number and course name</b>	E6112 IT Compliance E6113 Audit and Monitoring
<b>Instructors</b>	Prof. Dr. Georg Herde Prof. Dr. Horst Kunhardt
<b>Semester</b>	6
<b>Length of module</b>	1 semester
<b>Module frequency</b>	semi-annually
<b>Status in curriculum</b>	Specialised Mandatory Elective Subject
<b>Level</b>	Bachelor
<b>SWS</b>	5.0
<b>ECTS</b>	6.0
<b>Workload</b>	Class time: 75 hours Independent Study: 105 hours Total: 180 hours
<b>Language of instruction</b>	German
<b>Admission requirements / prerequisites</b>	Formal Languages, Data Structures and Algorithms (Bachelor Business Informatics) Databases (Bachelor Business Informatics) Data Warehouse (Bachelor Business Informatics) ERP Systems (Bachelor Business Informatics)
<b>Teaching and learning methods</b>	Submodule I: Seminar-style lecture Submodule II: Seminar
<b>Further information</b>	Part of the course will be available online (e.g. SAP Example Processes) Guest lectures from practitioners from the following fields: - Internal Audit - Financial Audit - IT Compliance
<b>Type of examination</b>	Written exam or oral exam or evaluation of student work

### Learning objectives

Virtually all companies, federal organisations and federally regulated organisations which use information and communication technology (ICT) must meet regulatory requirements determined through national and international laws and standards and follow internal procedural instructions and guidelines. The pervasiveness of IT in modern-day companies and the degree of dependence on well-functioning ICT systems is extremely high; thus management must ensure that the ICT used is operating in such a way that issues and information worthy of protection are safeguarded against internal and external customers, employees and supervisory organisations. IT Compliance or Corporate Compliance as a management system helps to maintain an overview of the rights

and obligations warranting protection which arise from ICT operations. Furthermore, it helps to ensure the targeted implementation, further development and ongoing review of available tools such as CobiT, ITIL and UCF. IT compliance, IT security management and IT risk management are steps on the path toward sustainable and holistic IT governance.

Furthermore, the module should enable students to analyse and evaluate company data from a critical perspective independent of the evaluation tools of operative application systems and ERP systems (SAP R/3, Navision, People Soft, etc.) in order to set agreed upon compliance targets and IT Risk management requirements and to carry out plausibility controls. The student should be able to design and implement Fraud Risk Assessment Tools and Data Analysis tools for use in the areas of monitoring and auditing in company departments and in auditing professions (internal and external auditors and tax advisors).

Upon completion of the module "IT Compliance & Audit and Monitoring" the students will have reached the following learning objectives:

- The students know the origins and the objectives of IT compliance and IT governance in a company
- The students recognize the interdisciplinary approach of IT compliance in relation to IT security management and risk management
- Students can critically evaluate the practical applicability of the legal framework of ICT utilisation through practical examples. Maturity models such as CMMI help students to develop an appropriate approach to dealing with regulatory IT compliance requirements.
- Students practice how to responsibly deal with the concepts of IT compliance and IT governance using cost-benefit considerations.
- They learn how to extract mass data on the basis of:
  - legal, administrative framework requirements (data protection, data security)
  - extraction without performance loss in operative systems
  - processing data in an analysable format
- They are able to reproduce data models on a system-neutral platform
- They can generate business administrative questions typical in auditing as well as derived plausibility checks and auditing approaches.
- They are able to model auditing approaches in an analysis tool taking into account the following:
  - mass data evaluation

- clarity of the auditing approach

## **Content**

The course has a two-part structure. It consists of the submodules IT Compliance and Audit & Monitoring. Both submodules are primarily classroom-based courses, although the second submodule also includes independent project work in addition to the in-class component.

### **Submodule IT Compliance**

1. Introduction to the Legal Framework of ICT Use
  - 1.1 National and international legislation structures and standardization
2. Definition IT Compliance, IT Governance
3. Interdisciplinary Aspects of IT Compliance
  - 3.1 Connection with an integrated IT security management system
  - 3.2 Determining security needs based on the IT Grundschutzhandbuch (Basic IT Protection Handbook)
  - 3.3 Driver processes of IT Compliance
4. IT Compliance with Consideration of COBIT
5. Cost-Benefit Considerations of IT Compliance
6. Management Processes of IT Compliance
  - 6.1 Maturity models
7. Outsourcing and IT Compliance
8. Examples from Practice and Case Studies

### **Submodule Audit and Monitoring, Part I**

1. Introduction to Digital Data Analysis
2. Motivation of IT Audit Support
3. Example Process Mapping in SAP R/3 (as well as virtual)
4. Explanation of Exemplary Audit Approaches
  - Identifying Relevant Tables and Fields of Audit Approaches
  - Conventional Data Extraction from SAP©
  - Mass Data Extraction Using External Tools
  - Introduction to Determined Analytical Instruments
  - Solutions for Audit Approaches
  - Standardised Audit Routines

## **Submodule Audit and Monitoring, Part II**

In the second part of the course, students present a self-chosen case study which implements the above content in an exemplary fashion. Important key points of the project work are:

1. The Process of Gathering Data Material
2. Data Extraction and Processing
3. Formulating an Audit Approach
4. Implementing the Audit Approach
5. Interpretation of the Results
6. Deriving Alternative Courses of Action and Measures

### **Recommended literature**

Kagermann, H., Kinney, W., Küting, K., Weber, C., Internal Audit Handbook, Management with the SAP® Audit Roadmap, Springer Verlag, 2008

Reding, K., Sobel, P. at. al., Internal Auditing: Assurance & Consulting Services, The Institute of Internal Auditors, 2007

Knapp, E., Interne Revision und Corporate Governance, Erich Schmidt Verlag, 2. Aufl. 2009

Coenen, T., Essentials of Corporate Fraud, John Wiley & Sons, Inc., Hoboken, New Jersey 2008

Coderre, D., CAATTs & other BEASTs for Auditors, 2nd Edition, Global Audit Publications, Vancouver, Canada 2001

Kühling, J., Seidel, Ch., Sivridis, A.: Datenschutzrecht, UTB, Frankfurt 2008

Herde, G., Extraktion und Analyse betrieblicher Massendaten zur Prüfungsunterstützung, in: Fuchs, G., Herrmann, F., Müller, C., Wirtz, K.-W. [Hrsg.], Anwendungen und Techniken zur Analyse großer Datenbestände, Tagungsband zur AKWI-Fachtagung, Verlag News & Media, Berlin 2008, S. 50-61

Boenner, A., Herde, G., Digitale Prüfungsunterstützung: STANDARD Audit ANALYSIS (STAAN), in: DIIR, Deutsches Institut für interne Revision e.V. [Hrsg.]: Interne Revision aktuell Berufsstand 07/08: Prüfungsansätze und -methoden, Erich Schmidt Verlag GmbH & Co., Berlin 2008, S. 349-366

DFDDA e.V. [Hrsg.], Digitale Datenanalyse, Interne Revision und Wirtschaftsprüfung, Tagungsband des 4. Deggendorfer Forums 2008, Erich Schmidt Verlag, Berlin, 2009

Herde, G. [Hrsg.], 3. Deggendorfer Forum zur digitalen Datenanalyse, Tagungsband des 3. Deggendorfer Forums 2007, rtw medien verlag, Deggendorf 2008

Herde, G. [Hrsg.], 1. Deggendorfer Forum zur digitalen Datenanalyse, Tagungsband des 1. Deggendorfer Forums 2005, rtw medien verlag, Deggendorf 2007,

Herde, G. [Hrsg.], 2. Deggendorfer Forum zur digitalen Datenanalyse, Praktische Möglichkeiten und Perspektiven, Tagungsband des 2. Deggendorfer Forums 2006, rtw medien verlag, Deggendorf 2007