

# Module Catalogue

»International Information Systems«

Bachelor

SPO 2024



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The following text is a commentary in English language on the module manual of Technische Hochschule Augsburg, helping you to understand the contents of the German document. The legally binding text remains the German version of the module manual. Please refer to the German text if possible or seek advice in case of uncertainties. The purpose of the module descriptions is to provide a content-related overview of your degree course.

Only the current version of the university catalogue and examination regulations shall be deemed legally binding.

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# 1 International Information Systems Bachelor - Orientation Phase

## 1.1 Programming 1

### Information about the module

engl. Name	Programming 1
Code	PRG1
Coordinator	Prof. Dr. Jens Lauterbach
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Programming 1 (4 Credit hours) Practical work Programming 1 (2 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 8, Contact hours: 90h, Independent study: 150h, Total workload: 240h

### Exam

Admission requirement for the examination	Practical work Programming 1
Type of exam / required course achievements	Written examination, 60 minutes, carried out as electronic examination Auxiliaries: Development environment, authorized lecture and exercise materials, Java API documentation, Moodle
Examination number ( according to SPO no. 1.1 )	

**Content of the module**

This lecture introduces students to the core concepts of programming based on the programming language JAVA. JAVA is one of the important languages of our time and it is widely used in business.

The focus of the lecture lies on the concepts and methods of programming. These concepts and methods will be introduced and explained with examples in JAVA.

The first part of the lecture provides the context with key terminology of business informatics and software engineering. It then introduces to the fundamentals of programming with basic JAVA language elements, simple data types, variables, expressions and operators. Then control structures, complex data types and methods will be introduced. The second part of the lecture provides an introduction to object-orientation and its application in JAVA.

The lecture will provide the concepts and methods that will then be practiced in hands-on exercises with a state-of-the art integrated development environment (IDE, e. g., Eclipse). Students will develop and implement algorithms in JAVA and will be evaluated based on their ability to apply the knowledge from the lecture in practice.

**Qualification aims for the module learning objectives/skills**

Students will get an introduction to the core concepts of programming using JAVA. After successful participation, students will be able to:

- Understand and describe key elements of the programming language JAVA
- Know the key concepts of OO programming languages
- Understand JAVA source code of low to medium complexity
- Independently implement algorithms in JAVA
- Independently develop own algorithms
- Quickly familiarize themselves with other programming languages

**Reading list**

Literature recommendations will be provided in the lecture.



## 1.2 1st Foreign Language

### Information about the module

engl. Name	1st Foreign Language
Code	FL1
Coordinator	Prof. Dr. Svea Schauffler
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	1st Foreign Language (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is usually taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Portfolio exam: <ul style="list-style-type: none"><li>• Oral examination A, 10-20 minutes, 20%</li><li>• Oral examination B, 10-20 minutes, 20%</li><li>• Written examination, 90 minutes, none auxiliaries, 60%</li></ul>
Examination number ( according to SPO no. 1.2 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The course is a combination of teacher input, independent self study, and language teaching based on a communicative methodology which includes the interaction of all participants. Groups usually comprise 20-25 participants.

### **Qualification aims for the module learning objectives/skills**

The aim of this mandatory language course is for participants to use English confidently as part of their studies but also in the workplace.

This is achieved using an interactive and application-based methodology for language teaching. The focus is on useful skills such as text comprehension, technical vocabulary, written correspondence, oral communication, presenting, and negotiating in English.

### **Reading list**

Will be provided in class.

### 1.3 Mathematics 1

#### Information about the module

engl. Name	Mathematics 1
Code	MAT1
Coordinator	Prof. Dr. Caroline Justen
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Mathematics 1 (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	The topics are relevant for the mathematics 2 module
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

#### Exam

Type of exam / required course achievements	Written examination, 60 minutes, auxiliaries: 2 DIN A4 pages handwritten formulary; a calculator that can't calculate 70! (70 Factorial)
Examination number ( according to SPO no. 1.3 )	
Grading	According to § 20 of the APO in the currently valid version.



### Content of the module

- Propositional logic
- Infinite sequences and series
- Real-valued functions
- Financial mathematics
- Derivatives
- Complex numbers

### Qualification aims for the module learning objectives/skills

Students passing the course successfully will be able to:

- develop new mathematical knowledge from calculus and linear algebra which are not part of the mathematics 2 modul:
  - understanding problems in mathematical language
  - solving mathematical problems of low and medium complexity
  - transferring mathematical knowledge taught in the course to new simple problems
- train logical reasoning
- model simple practical problems in mathematical language
- use mathematical textbooks to extend the mathematical topics of the lectures

### Reading list

**J. Stewart, S. Watson, D.K. Clegg:** Calculus: Early Transcendentals, *Metric Edition Cengage Learning, Inc, 9th edition, 2020.*

**K. Sydsaeter, P. Hammond, A. Strom, A. Carvajal:** Essential Mathematics for Economic Analysis, *Pearson Education, 6th edition, 2021.*

**G. Strang:** Calculus, *Wellesley-Cambridge Press, 3rd edition, 2017.*

**Opitz, O.; Etschberger, S.; Burkart, W.R.; Klein R. :** Mathematik, Lehrbuch für das Studium der Wirtschaftswissenschaften. *De Gruyter Oldenbourg, 12. Auflage, 2017.*

## 1.4 Introduction to Business Administration, Financial Accounting

### Information about the module

engl. Name	Introduction to Business Administration, Financial Accounting
Code	IBA
Coordinator	Prof. Dr. Stephan Zimmermann
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Introduction to Business Administration, Financial Accounting (6 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 7, Contact hours: 90h, Independent study: 120h, Total workload: 210h

### Exam

Type of exam / required course achievements	Written examination, 90 minutes, auxiliary: calculator
Examination number ( according to SPO no. 1.4 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

Business Administration:

- Fundamentals of economics
- Scientific approach of business administration
- Entrepreneurship and constitutive management decisions (business model, choice of legal form and location, corporate constitution)
- Value Chain (marketing and sales, production, materials management)
- Organization and human resources management
- Operational taxes

Financial accounting:

- Terms and rules of external accounting
- Technique of double-entry bookkeeping
- Balance sheet: structure, content, transactions
- Profit and loss account: structure, content, business transactions
- Basics of balance sheet analysis

## **Qualification aims for the module learning objectives/skills**

Upon successful completion of the module, students will be able to:

- Understand elementary theories of economics
- Recognize challenges, tasks and methods of business administration
- Explain constitutive decisions of companies
- Outline basic value chain and leadership processes in a company
- Explain the tasks and rules of financial accounting
- Apply the system of double-entry bookkeeping.

## Reading list

### Business Administration:

**Thommen, Jean-Paul; Grösser, Stefan (2014):** Economy, Company, Management. Introduction to Business Administration. Zürich

**Eichhorn, Peter; Towers, Ian (2018):** Principles of Management. Efficiency and Effectiveness in the Private and Public Sector. Cham: Springer International Publishing

**Kolmar, Martin (2017):** Principles of Microeconomics. An Integrative Approach. Cham: Springer International Publishing

**Pride, William M.; Hughes, Robert J.; Kapoor, Jack R. (2019):** Foundations of business. 6E. Boston: Cengage.

**Mazzarol, Tim (2020):** Entrepreneurship and Innovation. Fourth edition. Singapore: Springer (Springer Texts in Business and Economics).

### Financial Accounting:

**Nothhelfer, Robert:** Financial Accounting. Introduction to German GAAP with exercises (2017). München, Wien: De Gruyter Oldenbourg (De Gruyter Textbook).

**Epstein, Lita; Tracy, John A. (2015):** Bookkeeping all-in-one for dummies. Hoboken, NJ: John Wiley & Sons (For dummies). 2nd Edition



## 1.5 2nd Foreign Language 1 of 4

### Information about the module

engl. Name	2nd Foreign Language 1 of 4
Code	II2.FS
Coordinator	Lecturers at the Faculty of Liberal Arts and Sciences
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	2nd Foreign Language 1 of 4 (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in German for non-native students. Depending on the selection, the module will be taught in Spanish, French, Italian or Chinese language
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	<p>Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences</p> <p>In the foreign language German Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, 30-90 minutes, 60%</li> <li>• Oral examination, 10-40 minutes, 40%</li> </ul> <p>In the foreign languages French, Italian and Spanish Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 20%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> <li>• project work (workload: max. 15 h, in the form of a simulation), 30%</li> </ul> <p>In the foreign language Chinese Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 50%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> </ul>
Examination number ( according to SPO no. 1.5 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The course is a combination of linguistic input by the teacher, independent self-study and communicative and application-oriented language teaching in which all participants are involved. The course takes place in groups of 20-25 participants.

### **Qualification aims for the module learning objectives/skills**

The goal of this compulsory curriculum is to achieve confidence with the terminology of this subject and its professional environment. This is achieved through task-based and interactive teaching in the foreign language. The course puts emphasis on crucial and practical skills such as reading comprehension, technical vocabulary, written correspondence, confident verbal communication, presentation and negotiation.

## **Reading list**

Literature recommendations will be provided in the lecture.





## 1.6 Mathematics 2

### Information about the module

engl. Name	Mathematics 2
Code	MAT2
Coordinator	Prof. Dr. Caroline Justen
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Mathematics 2 (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	Module Mathematics 1 (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, auxiliaries: 2 DIN A4 pages handwritten formulary; a calculator that can't calculate 70! (70 Factorial)
Examination number ( according to SPO no. 2.1 )	
Grading	According to § 20 of the APO in the currently valid version.

## Content of the module

- Integration
- Systems of linear equations
- Linear Algebra
- Multivariable functions
- Linear Optimization

## Qualification aims for the module learning objectives/skills

Students passing the course successfully will be able to:

- develop new mathematical knowledge from calculus and linear algebra which are not part of the mathematics 1 modul:
  - understanding problems in mathematical language
  - solving mathematical problems of low and medium complexity
  - transferring mathematical knowledge taught in the course to new simple problems
- train logical reasoning
- model simple practical problems in mathematical language
- use mathematical textbooks to extend the mathematical topics of the lectures

## Reading list

**J. Stewart, S. Watson, D.K. Clegg:** *Calculus: Early Transcendentals, Metric Edition Cengage Learning, Inc, 9th edition, 2020.*

**K. Sydsaeter, P. Hammond, A. Strom, A. Carvajal:** *Essential Mathematics for Economic Analysis, Pearson Education, 6th edition, 2021.*

**G. Strang:** *Calculus, Wellesley-Cambridge Press, 3rd edition, 2017.*

**Opitz, O.; Etschberger, S.; Burkart, W.R.; Klein R. :** *Mathematik, Lehrbuch für das Studium der Wirtschaftswissenschaften. De Gruyter Oldenbourg, 12. Auflage, 2017.*

## 1.7 Programming 2 & Software Engineering

### Information about the module

engl. Name	Programming 2 & Software Engineering
Code	PRG2
Coordinator	Prof. Dr. Jens Lauterbach
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Programming 2 & Software Engineering (4 Credit hours) Practical work Programming 2 & Software Engineering (2 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	Module Programming 1 (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 8, Contact hours: 90h, Independent study: 150h, Total workload: 240h

### Exam

Admission requirement for the examination	Practical work Programming 2 & Software Engineering
Type of exam / required course achievements	Written examination, 60 minutes, carried out as electronic examination Auxiliaries: Development environment, authorized lecture and exercise materials, Java API documentation, Moodle
Examination number ( according to SPO no. 2.2 )	
Grading	According to § 20 of the APO in the currently valid version.

## Content of the module

Larger software applications are developed in practice in teams using a methodical approach. As a basis for this, the concepts, methods and tasks of software engineering (SE), which go beyond pure programming, are presented in this course:

- Agile and classic SE process models (e.g. Scrum)
- Requirements engineering (e.g. with user stories)
- Design and architecture (e.g. with UML)
- Validation (e.g. unit tests and test management)
- Versioning and deployment (e.g. with Git)
- Operation (e.g. DevOps)

Based on foundations of the lecture Programming 1, further concepts and constructs of modern programming languages are taught using JAVA. The module deals with the following content:

- Repetition and deepening of the foundations and understanding of object-oriented programming
- Introduction of other important concepts, such as e. g. helper classes and frameworks for working with JAVA
- Introduction and deepening of input/output concepts such as streams and parallel programming with threads
- Introduction to distributed applications
- Introduction to functional programming

## Qualification aims for the module learning objectives/skills

After successful participation in the module, students are able to:

- describe basic knowledge of programming including the concepts of object-oriented programming
- grasp requirements and tasks, to abstract them and to solve them using programming language tools
- familiarize themselves with further concepts or other programming languages
- understand and apply the tasks and methods of (agile) software engineering.

## Reading list

Literature recommendations will be provided in the lecture.

## 1.8 Introduction to Information Systems

### Information about the module

engl. Name	Introduction to Information Systems
Code	ISY
Coordinator	Prof. Dr. Arne Mayer
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Introduction to Information Systems (3 Credit hours) Practical work Introduction to Information Systems (1 Credit hour)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Admission requirement for the examination	Practical work Introduction to Information Systems
Type of exam / required course achievements	Written examination, 60 minutes, auxiliary: non-programmable calculator
Examination number ( according to SPO no. 2.3 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

- Fundamentals and Definitions of Information Systems
- Business Process Management and Modeling
- Information systems, esp. Key System Applications
- IT strategies, Enterprise Architecture Management, Information management
- Case studies on complex integrated business processes and information systems

### **Qualification aims for the module learning objectives/skills**

After successful completion of the module, students will be able to:

- To describe the subject areas assigned to information systems discipline. You will be able to explain the four layer principle and how it differs from business administration and computer science.
- Understand the challenges and tools used to describe IT systems and are able to independently document business processes using common methods
- Master basic terms, methods, concepts and applications of operational information processing and integrated systems.
- Students understand IT strategies and their necessity; They are familiar with IT organizational structures and relevant working methods/methods for the design of IT systems and are able to analyze IT landscapes with the help commons methods such as Enterprise Architecture Management methods

### **Reading list**

**Laudon, K. C., Laudon J. P.:** Management Information Systems: Managing the Digital Firm, current edition, Pearson

Annual update in the lecture due to the innovative nature

## 1.9 Intercultural Management & Law

### Information about the module

engl. Name	Intercultural Management & Law
Code	IML
Coordinator	Prof. Dr. Svea Schaufler Frank Falker, LL.M.
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Intercultural Management & Law (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 120 minutes, Intercultural Management: none auxiliaries; Law: auxiliary Collection of laws
Examination number ( according to SPO no. 2.4 )	
Grading	According to § 20 of the APO in the currently valid version.



## Content of the module

Intercultural barriers and the resulting misunderstandings can strongly influence any business decision and the possible results. Due to this, the development of intercultural competence is of utmost importance for both executives and managers to be successful in an international and dynamic business environment. International project management through global information systems is therefore of great importance. This course examines the relationship between culture and management and highlights the complexities of managing in international business. Basic psychological and sociological constructs underlying the creation and maintenance of international cooperation are analyzed. Special attention is given to the impact of globalization and the various forms of international alliances, as well as diversity and change management in this context. In this context, legal issues are also relevant, especially for the management, development and operation of information systems. The module creates a basic understanding of the relevant legal concepts based on the topics:

### Private Law

- legal transactions
- General and special law of obligations
- Property law

### Internet law

- Protection of domains
- Electronic Commerce
- Liability for damages and limitation of liability Copyright law

### Competition Law

- Basic concepts
- Protection and liability
- Claims for damages

### Data protection

- Characteristics and basic terms
- Applicable legal provisions
- Telecommunications data protection

### **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students will be able to:

- reproduce a basic psychological and sociological understanding of culture formation
- classify the basics of the most important culture researchers and measurement models
- specify risks and precautions in international business
- identify the impact of globalization on culture and management
- identify the basic features of private law and basic features of data processing law, including the importance of data protection, as well as their practical significance.
- interpret basic knowledge of legal casework in contract law.
- apply acquired knowledge in professional and everyday life.

### **Reading list**

Literature will be announced in the seminar.



## 1.10 2nd Foreign Language 2 of 4

### Information about the module

engl. Name	2nd Foreign Language 2 of 4
Code	II2.FS
Coordinator	Lecturers at the Faculty of Liberal Arts and Sciences
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	2nd Foreign Language 2 of 4 (4 Credit hours)
Modul area	Orientation Phase
Teaching language	The module is taught in German for non-native students. Depending on the selection, the module will be taught in Spanish, French, Italian or Chinese language
Teaching and learning methods	Seminar format, practical work
Prerequisites	The module 2nd Foreign Language 2 of 4 builds on the 2nd Foreign Language 1 from 4 and is assumed. (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	<p>Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences</p> <p>In the foreign language German Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, 30-90 minutes, 60%</li> <li>• Oral examination, 10-40 minutes, 40%</li> </ul> <p>In the foreign languages French, Italian and Spanish Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 20%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> <li>• project work (workload: max. 15 h, in the form of a simulation), 30%</li> </ul> <p>In the foreign language Chinese Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 50%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> </ul>
Examination number ( according to SPO no. 2.5 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The course is a combination of linguistic input by the teacher, independent self-study and communicative and application-oriented language teaching in which all participants are involved. The course takes place in groups of 20-25 participants.

### **Qualification aims for the module learning objectives/skills**

The goal of this compulsory curriculum is to achieve confidence with the terminology of this subject and its professional environment. This is achieved through task-based and interactive teaching in the foreign language. The course puts emphasis on crucial and practical skills such as reading comprehension, technical vocabulary, written correspondence, confident verbal communication, presentation and negotiation.

## **Reading list**

Literature recommendations will be provided in the lecture.



## 2 International Information Systems Bachelor - Intensification Phase

### 2.1 Statistics

#### Information about the module

engl. Name	Statistics
Code	STAT
Coordinator	Prof. Dr. Phil. Alessandra Zarcone
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Statistics (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

#### Exam

Type of exam / required course achievements	Written examination, 90 minutes, auxiliaries: 2 DIN A4 pages handwritten, statistics software (R) on own laptop
Examination number ( according to SPO no. 3.1 )	
Grading	According to § 20 of the APO in the currently valid version.



## **Content of the module**

- Introduction to statistics and to R
- Descriptive statistics: measures of central tendency, measures of dispersion, distributions
- Visualization with R
- Basic Probability Theory
- Looking at relationships: Correlation
- Prediction: Regression, Multiple Regression and Logistic regression
- Elements of Inferential statistics: hypothesis testing, comparing means, confidence intervals, significance testing, model evaluation
- Reporting of statistical models and results

## **Qualification aims for the module learning objectives/skills**

After successfully completing this module, the students are able to:

- know and understand the most important statistical properties such as mean, median, percentile, quantile, variance, co-variance, correlation, auto correlation, variation coefficient and confidence intervals
- understand descriptive statistics methods and employ them for exploratory data analysis
- perform exploratory data analysis with R
- understand data visualization and create simple plots using R
- understand basic probability theory methods and solve simple problems using them
- formulate the assumptions behind different models and understand how to choose an appropriate model
- apply inferential statistics methods to evaluate statistical models
- apply the methods learned using the statistical software R and interpret the output coming from the software

## Reading list

**Field, Andy; Miles, Jeremy; Field, Zoe:** Discovering Statistics Using R, SAGE Publications, 1. Aufl. 2012

**Bruce, Peter; Bruce, Andrew; Gedeck, Peter:** Practical Statistics for Data Scientists, O'Reilly, 2. Aufl. 2020

**Winter, Bodo: Statistics for Linguists:** An Introduction Using R, Routledge. 1. Aufl. 2019

Software:

- R: <https://www.r-project.org/>



## 2.2 Implementation of Enterprise Systems

### Information about the module

engl. Name	Implementation of Enterprise Systems
Code	CUST
Coordinator	Prof. Dr. Jens Lauterbach
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Customizing of Information Systems (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Portfolio exam: <ul style="list-style-type: none"><li>• Written examination, 60 minutes, auxiliaries: authorized lecture notes, 50%</li><li>• Practical examination (10-30 pages) and oral examination (10-30 minutes), 50%</li></ul>
Examination number ( according to SPO no. 3.2 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

This lecture introduces to Enterprise Systems (ES), that represent a specific category of information systems. They build on pre-packaged industry best practices embedded in standardized product software and target large-scale integration of data and business processes across all company's functional areas and beyond company borderlines.

In the first part of the lecture, after an introduction to the key terms and definitions for ES, process-centric ES and in particular Enterprise Resource Planning (ERP) Systems will be discussed in detail. ERP Systems such as SAP S/4 HANA are the core business applications for many organizations. The lecture will examine

- Fundamentals of ERP Systems
- Basic Functionalities of ERP Systems with the example SAP S/4 HANA
- Core processes such as “Order to Cash” and “Procure to Cash”

The second part of the lecture presents the core concepts of ES implementations. With these concepts the necessary steps to configure/customize an ERP system such as SAP S/4 HANA are elaborated.

## **Qualification aims for the module learning objectives/skills**

Students will get an introduction to the core concepts of Enterprise Systems as specific category of Information Systems. After successful participation, students will be able to:

- Understand and describe the different types and concepts of Enterprise Systems
- Understand and describe the functions and processes covered by ERP Systems
- Use the SAP S/4 HANA System for important core processes
- Understand and describe the core concepts of Enterprise System Implementations
- Configure/customize core features of the SAP S/4 HANA System

## **Reading list**

Literature recommendations will be provided in the first lecture.

## 2.3 Database Systems

### Information about the module

engl. Name	Database Systems
Code	DBS
Coordinator	Prof. Matthias Kolonko, Ph.D. (ONPU)
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Database Systems (4 Credit hours) Practical work Database Systems (2 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 7, Contact hours: 90h, Independent study: 120h, Total workload: 210h

### Exam

Admission requirement for the examination	Practical work Database Systems
Type of exam / required course achievements	Written examination, 90 minutes, none auxiliaries Alternative Portfolio exam with equally weighted parts: <ul style="list-style-type: none"><li>• written examination 1, 30 min</li><li>• written examination 2, 30 min</li><li>• written examination 3, 30 min</li></ul>
Examination number ( according to SPO no. 3.3 )	

**Content of the module**

The course focuses on three central points in the area of database systems. The first key point is the semantic data modeling and the system-independent database design. It is followed by the implementation using relational database systems with SQL. Subsequently, the normal form theory is addressed into more depth. During the course, both practical and theoretical aspects are examined. The architecture of a database management system (RDBMS) is illustrated using a common RDBMS.

An instance of a relational database system will be provided for SQL exercises. During the practical training, the design and realization of an appropriate database structure is requested from the students by means of a self-imposed topic.

**Qualification aims for the module learning objectives/skills**

After having successfully accomplished the course, participants shall be able to

- describe the fundamental architecture and operational principles of a database system.
- perform analysis and data modeling (both conceptual and logical database design).
- name and utilize the fundamental SQL operations.
- implement data structures and queries using SQL (DDL & DML).
- perform an analysis and normalization of a logical data model with regard to the theory of normal forms.

**Weighting of individual performance in the final grade**

Written exam (100%) or Portfolio with 3 written exams (each with the same weighting)

## Reading list

- R. Elmasri, S. B. Navathe: *Fundamentals of Database Systems* (Pearson 2020, ISBN: 1-292-09761-2)
- S. Müllenbach, L. Kern-Bausch, M. Kolonko: Conceptual Modeling Language AGILA MOD  
in Herald of Advanced Information Technology, vol. 2, no. 4, pp. 246-258, Dez. 2019  
(ISSN: 2663-0176 – DOI: 10.15276/hait.04.2019.1)
- M. Kolonko, S. Müllenbach, E. Arsirii, B. Trofymov: *Extensions to the Conceptual Modeling Language AGILA MOD*  
in Proceedings of the VI. Ukrainian-German conference „Informatics. Culture. Technology“, Odessa, Sept. 2018, pp. 38-39
- L. Kern-Bausch, M. Jeckle: Informationsmodellierung und logischer Datenbankentwurf, Kapitel 14.2  
in Taschenbuch der Informatik (U. Schneider und D. Werner), 4. Auflage, Fachbuchverlag Leipzig im Carl Hanser Verlag, 2001,  
ISBN: 3-446-21753-3
- P. Sauer: *Informationsmodellierung, Kapitel 2*  
in Taschenbuch Datenbanken (T. Kudraß), 2. Auflage, Fachbuchverlag Leipzig im Carl Hanser Verlag, 2015,  
ISBN: 978-3-446-43508-7
- Vorlesungsunterlagen von Prof. Dr. Sabine Müllenbach unter <https://ohs.informatik.hs-augsburg.de:4443/web/bine>  
(Anmeldung mit RZ-Login)





## 2.4 Programming of Enterprise Systems

### Information about the module

engl. Name	Programming of Enterprise Systems
Code	PRG3
Coordinator	Prof. Dr. Jens Lauterbach
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Programming 3 (4 Credit hours) Practical work Programming 3 (2 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	Programming 1 (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 8, Contact hours: 90h, Independent study: 150h, Total workload: 240h

### Exam

Admission requirement for the examination	Practical work Programming of Enterprise Systems
Type of exam / required course achievements	Written examination, 60 minutes, carried out as electronic examination Auxiliaries: SAP, authorized lecture and exercise materials, Moodle
Examination number ( according to SPO no. 3.4 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

This lecture introduces concepts of programming that are required when organizations want to change or extend their Enterprise Systems (ES). This can for example be required in ES implementations, when the organization introduces a new system and the system needs to be adapted to meet business requirements. As technology platform SAP S/4 HANA will be used and the programming language ABAP.

The first part of lecture presents the fundamentals of programming for Enterprise Systems such as:

- Technical fundamentals and architecture
- Basic ABAP language elements
- ABAP reporting
- Simple data types, variables
- Expressions and operators
- Control structures
- Functions
- Complex data types

The second part of the lecture introduces advanced programming concepts

- Object Oriented Reporting with Abap Objects
- Events
- Interfaces
- Inheritance
- Exceptions
- Advanced programming techniques

## **Qualification aims for the module learning objectives/skills**

Students will get an introduction to the programming of Enterprise Systems using SAP S/4 HANA and ABAP.

After successful participation, students will be able to:

- Understand and describe key elements of the programming language ABAP
- Understand ABAP source code
- Independently implement algorithms in ABAP
- Independently develop simple algorithms

## **Reading list**

Literature recommendations will be provided in the first lecture.



## 2.5 2nd Foreign Language 3 of 4

### Information about the module

engl. Name	2nd Foreign Language 3 of 4
Code	II2.FS
Coordinator	Lecturers at the Faculty of Liberal Arts and Sciences
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	2nd Foreign Language 3 of 4 (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in German for non-native students. Depending on the selection, the module will be taught in Spanish, French, Italian or Chinese language
Teaching and learning methods	Seminar format, practical work
Prerequisites	The module 2nd Foreign Language 3 of 4 builds on the 2nd Foreign Language 2 and 1 from 4 and is assumed. (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	<p>Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences</p> <p>In the foreign language German Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, 30-90 minutes, 60%</li> <li>• Oral examination, 10-40 minutes, 40%</li> </ul> <p>In the foreign languages French, Italian and Spanish Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 20%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> <li>• project work (workload: max. 15 h, in the form of a simulation), 30%</li> </ul> <p>In the foreign language Chinese Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 50%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> </ul>
Examination number ( according to SPO no. 3.5 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The course is a combination of linguistic input by the teacher, independent self-study and communicative and application-oriented language teaching in which all participants are involved. The course takes place in groups of 20-25 participants.

### **Qualification aims for the module learning objectives/skills**

The goal of this compulsory curriculum is to achieve confidence with the terminology of this subject and its professional environment. This is achieved through task-based and interactive teaching in the foreign language. The course puts emphasis on crucial and practical skills such as reading comprehension, technical vocabulary, written correspondence, confident verbal communication, presentation and negotiation.

## **Reading list**

Literature recommendations will be provided in the lecture.





## 2.6 Data Analytics

### Information about the module

engl. Name	Data Analytics
Code	DAT
Coordinator	Prof. Dr. Wolfgang Kratsch
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Data Analytics (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, none auxiliaries
Examination number ( according to SPO no. 4.1 )	
Grading	According to § 20 of the APO in the currently valid version.

## Content of the module

Due to the advancing digitalization, data plays an increasingly important role in decision-making in companies. Today, companies no longer rely solely on traditional business intelligence tools to analyze their data. Under the term advanced analytics, they also use methods of statistics and machine learning to make forecasts about future events today and derive recommendations for action.

The resulting analytical information systems support decision-makers in companies by providing them with decision-relevant information, models and simulation results for different scenarios. Technologies such as online analytical processing (OLAP), data warehousing and data mining are used for this purpose. In companies, the focus is particularly on business analytics. This describes the process of so-called data refinement and visualization. It is a strategic tool for company managers. The focus is not only on the question "What was?", but also: "What will be?".

## Qualification aims for the module learning objectives/skills

After successful participation in the module, students will be able to:

- Explain data and how to use it in a business context to develop new or improve existing business models and processes.
- Execute the data analysis process from data preparation to algorithms for analysis to visualization of analysis results.
- Examine issues and scenarios based on company data.
- Classify the quality as well as the linkage of data analysis results.

## Reading list

**Chamoni, P.; Gluchowski, P** Analytische Informationssysteme: Business Intelligence-Technologien und –Anwendungen. 3. Auflage. Springer-Verlag: Berlin, Heidelberg 2006.

**Laudon, K. C.; Laudon, J. P.; Schoder, Detlef** Wirtschaftsinformatik – Eine Einführung. 2. Auflage. Pearson Studium: München et al. 2009.

**Laursen, G. H. N.; Thorlund, J.** Business Analytics for Managers: Taking Business Intelligence Beyond Reporting. 2. Auflage. Wiley: Hoboken 2016.

**Ware, C.** Information Visualization. 3. Auflage. Morgan Kaufmann: Waltham 2012.

## 2.7 E-Business

### Information about the module

engl. Name	E-Business
Code	EBUS
Coordinator	Prof. Dr. Arne Mayer
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	E-Business (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None; recommended: Introduction to business administration
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, none auxiliaries
Examination number ( according to SPO no. 4.2 )	
Grading	According to § 20 of the APO in the currently valid version.

## Content of the module

- Areas of e-business
- Technical and technological foundations of the internet economy as driver for e-business
- Functional view on e-Business information systems
- Economics of e-Business, especially electronic commerce
- E-Companies
- E-Communities
- E-Entertainment

## Qualification aims for the module learning objectives/skills

- An understanding of e-business and its areas and their impact on business as well as economy
- Abilities for analyzing relevant information systems and their underlying processes and workflows
- Practical relevant functional skills for upcoming employments in the industry
- Increased their soft skills due to case studies, discussions, and ability to present self-elaborated content

## Reading list

**Kollmann, Tobias.:** E-Business, Springer Gabler, 7. Auflage, 2019 (in German)

**Laudon, Kenneth C.;** **E-commerce:** business, technology, society, Pearson (Boston, MA), 2012.

**Peitz, Martin; Waldfogel, Joel:** The Oxford handbook of the digital economy, Oxford Univ. Press, 2012

**Reynolds, Jonathan:** **E-Business:** a management perspective, Oxford Univ. Press, 2010

## 2.8 International IT Project and Service Management

### Information about the module

engl. Name	International IT Project and Service Management
Code	IPSM
Coordinator	Prof. Dr. Clemens Espe, MBA
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	(4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, none auxiliaries
Examination number ( according to SPO no. 4.3 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

### **IT Project Management:**

- Methods for initiating projects/international projects and for stakeholder management
- Classical organizational forms of projects and international projects
- Teaching the necessary tools for planning time, costs and content of a project/international project
- Computer-aided tools for project management
- Methods for monitoring and controlling project progress
- Closing of projects/international projects

### **IT Service Management:**

- Processes according to the industry standard ITIL of the phases
  - Service Strategy,
  - Service Design,
  - Service Transition,
  - Service Operation and
  - Continual Service Improvement

### **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students will be able to:

- independently carry out the definition and structuring of projects.
- plan, execute and successfully complete projects independently and on their own responsibility with regard to time, costs and content
- use the instruments and statistical methods of project management in a manner appropriate to the situation
- plan projects using current computer-aided project management tools by independently recording and optimizing time, cost, budget and resource plans
- explain the ITIL framework with its five lifecycle phases and its 26 processes
- evaluate current service processes in the work environment and transfer the ideas, structures and best practices of the ITIL framework to improve these processes

## **Reading list**

**PMI (2013):** „A Guide to the Project Management Body of Knowledge“, Project Management Institute, 5th edition, 2013

**Tiemeyer (2018):** „Handbuch IT-Projektmanagement: Vorgehensmodelle, Managementinstrumente, Good Practices“, Hanser, 2018

**Burghardt (2012):** „Projektmanagement: Leitfaden zur Planung, Überwachung und Steuerung von Projekten“, Publicis Publishing, Erlangen 2012

**E. M. Goldratt (2002):** „Die Kritische Kette – Das neue Konzept im Projektmanagement“, Campus Verlag, Frankfurt, New York, 2002

**Hofstede (2010):** „Cultures and Organizations - SW of the Mind“, Mc Graw-Hill, 2010

**Axelos (2014):** „ITIL Lifecycle Suite“ (5 Bände), The Stationary Office, 2014

**Beims, Ziegenbein (2015):** „IT-Service Management in der Praxis mit ITIL“, Hanser, 2015





## 2.9 Project Work

### Information about the module

engl. Name	Project Work
Code	PROJ
Coordinator	Prof. Dr. Stephan Zimmermann (Director of Studies)
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Project Work (2 SWS)
Modul area	Intensification Phase
Teaching language	The module is taught in English and in German.
Teaching and learning methods	Project work, Seminar
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 8, Contact hours: 60h, Independent study: 180h, Total workload: 240h

### Exam

Type of exam / required course achievements	Portfolio exam: <ul style="list-style-type: none"><li>• Written assignment, 5-15 pages, 80%</li><li>• Oral examination, 5-30 minutes, 20%</li></ul>
Examination number ( according to SPO no. 4.4 )	
Grading	According to § 20 of the APO in the currently valid version.

### Content of the module

The students carry out IT projects in small teams. The tasks of the students include project management, as well as project implementation depending on the task as well as documentation and presentation of the results.

### **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students will be able to:

- understand team processes and resolve typical team conflicts.
- plan and execute IT projects in a team with regard to time, effort and resources.
- apply agile or classic project management methods in practice.
- select suitable methods and learn new techniques independently.
- document project results in a comprehensible and appealing manner.

### **Reading list**

Project specific Literature recommendations will be provided in the lecture.

## 2.10 2nd Foreign Language 4 of 4

### Information about the module

engl. Name	2nd Foreign Language 4 of 4
Code	II2.FS
Coordinator	Lecturers at the Faculty of Liberal Arts and Sciences
Faculty	Faculty of Liberal Arts and Sciences
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	2nd Foreign Language 4 of 4 (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in German for non-native students. Depending on the selection, the module will be taught in Spanish, French, Italian or Chinese language
Teaching and learning methods	Seminar format, practical work
Prerequisites	The module 2nd Foreign Language 4 of 4 builds on the 2nd Foreign Language 3, 2 and 1 from 4 and is assumed. (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	<p>Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences</p> <p>In the foreign language German Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, 30-90 minutes, 60%</li> <li>• Oral examination, 10-40 minutes, 40%</li> </ul> <p>In the foreign languages French, Italian and Spanish Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 20%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> <li>• project work (workload: max. 15 h, in the form of a simulation), 30%</li> </ul> <p>In the foreign language Chinese Portfolio exam:</p> <ul style="list-style-type: none"> <li>• Written examination, max. 60 minutes, 50%</li> <li>• Oral examination, max. 20 minutes, 20%</li> <li>• Written assignment, 2000 words, max. 9 pages, 30%</li> </ul>
Examination number ( according to SPO no. 4.5 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The course is a combination of linguistic input by the teacher, independent self-study and communicative and application-oriented language teaching in which all participants are involved. The course takes place in groups of 20-25 participants.

### **Qualification aims for the module learning objectives/skills**

The goal of this compulsory curriculum is to achieve confidence with the terminology of this subject and its professional environment. This is achieved through task-based and interactive teaching in the foreign language. The course puts emphasis on crucial and practical skills such as reading comprehension, technical vocabulary, written correspondence, confident verbal communication, presentation and negotiation.

## **Reading list**

Literature recommendations will be provided in the lecture.



## 2.11 Internship

### Information about the module

engl. Name	Internship
Code	PRAC
Coordinator	Advisor for Internship
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Internship (20 weeks)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Practical work
Prerequisites	The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.
Usage possibilities	International Information Systems
Total workload and its constituent parts	ECTS: 20, Total workload: 20 weeks

### Exam

Type of exam / required course achievements	Written assignment, 20 pages
Examination number ( according to SPO no. P.1 )	
Grading	According to § 20 of the APO in the currently valid version.



## **Content of the module**

Special feature:

As a special feature of studies at Bavarian universities, we offer you a legally required practical study semester integrated into your studies, in which the focus of knowledge transfer is shifted out into practice. During the practical semester, you retain your status as a student; the practical training is supplemented and deepened by accompanying teaching events at the university.

The Internship Office is responsible for the formal handling of the internship. Therefore, please also read the guidelines for the practical study semesters of the Internship Office.

In addition to the Internship Office, you will also have a professional supervisor. Please contact him or her as early as possible, especially if you have any problems with your internship.

## **Qualification aims for the module learning objectives/skills**

- Instruction to work independently and on one's own responsibility
- Introduction to the professional field by working as independently as possible and on your own responsibility
- Extension and deepening of knowledge about organizational problem solving in the company
- Knowledge of issues relating to the exercise of the profession, such as job opportunities, forms of employment law and workplaces
- Insight into relevant tax regulations and social security.

## **Weighting of individual performance in the final grade**

passed with success / passed without success

## **Reading list**

Literature recommendations will be provided during the practical work, if needed.

## 2.12 Practical Seminar

### Information about the module

engl. Name	Practical Seminar
Code	PSEM
Coordinator	Professors of the Faculty of Computer Science
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter semester
Courses	Practical Seminar (2 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar
Prerequisites	The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 2, CP credits: 2, Contact hours: 30h, Independent study: 30h, Total workload: 60h

### Exam

Type of exam / required course achievements	Oral examination, 15-30 minutes
Examination number ( according to SPO no. P.2 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

Students can

- present their own work correctly and comprehensibly according to scientific standards and answer questions.
- understand presentations on other work and participate in professional discussions.

## **Qualification aims for the module learning objectives/skills**

The students expand their competence for presentations.

## **Weighting of individual performance in the final grade**

passed with success / passed without success

## **Reading list**

Literature recommendations will be provided in the lecture.

## 2.13 Cost Accounting, Controlling & Financial Management

### Information about the module

engl. Name	Cost Accounting, Controlling & Financial Management
Code	COF
Coordinator	Prof. Dr. Jana Görmer-Redding
Faculty	Faculty of Computer Science
Type	Compulsory Module
Duration / Frequency	1 semester, winter semester
Courses	Cost Accounting, Controlling & Financial Management (6 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 6, CP credits: 8, Contact hours: 90h, Independent study: 150h, Total workload: 240h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, auxiliary: calculator
Examination number ( according to SPO no. 5.1 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

The module deals with questions of internal accounting and corporate management. For this purpose, methods of cost and performance accounting, controlling and financial management are deepened.

The contents of the sub-topics are:

Cost and performance accounting:

- Cost accounting methods
- Contribution margin accounting
- Planned costing

Controlling:

- Basics of controlling
- Strategic controlling
- Operational controlling

Financial management:

- Views of investment and financing problems
- Investment appraisal: Static & dynamic methods
- Financing decisions: Capital structure, equity financing, debt financing

### **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students are able to:

- structure decisions on the basis of methods of cost and activity accounting in the company.
- transfer the procedures of cost and performance accounting to different questions in the company.
- explain the role and significance of controlling for companies.
- describe the tasks and instruments of operative and strategic controlling and apply them to operational decision-making situations.
- characterise operational decision-making situations and to select and apply suitable investment and financing methods for this purpose.
- critically assess the strengths and weaknesses of different investment calculation methods.
- economically analyse different types and concepts of equity and debt financing.

### **Reading list**

**Becker, Wolfgang; Holzmann, Robert (2016):** Kosten-, Erlös- und Ergebnisrechnung. Wiesbaden: Springer Fachmedien Wiesbaden.

**Becker, Wolfgang; Holzmann, Robert; Hilmer, Christian (2016):** Übungen zur Kosten-, Erlös- und Ergebnisrechnung. Wiesbaden: Springer Fachmedien Wiesbaden.

**Wöltje, Jörg (2016):** Kosten- und Leistungsrechnung. Alle Verfahren und Systeme auf einen Blick. 2. Auflage. Freiburg: Haufe-Lexware GmbH & Co. KG.

**Weber, Jürgen; Schäffer, Utz:** Einführung in das Controlling, 14. Aufl. (oder älter), Stuttgart, Schäffer-Poeschel, 2014.

**Peemöller, Volker:** Controlling: Grundlagen und Einsatzgebiete, 5. Auflage (oder älter), Herne, nwb, 2005.

**Brealey R., Myers S.; Allen F. (2008):** Principles of Corporate Finance, Ninth Edition, New York.

**Breuer W. (2007):** Investition I, 3. Auflage, Wiesbaden.

**Copeland T., Weston J., Shastri K. (2008):** Finanzierungstheorie und Unternehmenspolitik, 4. Auflage, München.



## 2.14 Applied Artificial Intelligence

### Information about the module

engl. Name	Applied Artificial Intelligence
Code	AAI
Coordinator	Prof. Dr. Wolfgang Kratsch Prof. Dr. Björn Häckel
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Applied Artificial Intelligence (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, none auxiliaries
Examination number ( according to SPO no. 6.1 )	
Grading	According to § 20 of the APO in the currently valid version.



## **Content of the module**

In the module, selected current research work and fields of application in information systems of companies from the field of artificial intelligence are dealt with. Artificial intelligence is gaining importance in companies. Admittedly, we are still at the very beginning in the use of AI systems despite all the progress. Thanks to developments in the area of big data and algorithmic advances such as deep learning, the field of machine learning has developed rapidly in recent years and thus also provided the basis for ever greater support through artificial intelligence methods. The aim of this module is to understand these methods in an application-oriented corporate environment and in the context of information systems and to carry out use cases on this basis.

## **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students will be able to:

- reproduce basic theoretical and practical knowledge about the application areas of artificial intelligence and robotics in the context of information systems
- assess potentials and limits in the field of artificial intelligence
- describe current developments in the field of artificial intelligence
- carry out selected, company-specific use cases with the help of artificial intelligence

## **Reading list**

**Kersting, K., Lambert, C., & Rothkopf, C. (2020):** Wie Maschinen lernen - Künstliche Intelligenz verständlich erklärt. Springer, Wiesbaden

**Kreutzer, R.T.; Sirrenberg, M. (2019):** Künstliche Intelligenz verstehen, Springer Gabler, Wiesbaden

## 2.15 Production and Logistics

### Information about the module

engl. Name	Production and Logistics
Code	PROLO
Coordinator	Prof. Dr. Arne Mayer
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Production and Logistics (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar format, practical work
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, auxiliary: calculator
Examination number ( according to SPO no. 6.2 )	
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

- Introduction to production and logistics
- Business objects and processes
- Inventory management
- Procurement and procurement policy
- Production and production logistics
- Distribution logistics
- Disposal logistics
- Supply Chain Management (SCM)
- Overview of information and communication systems in production and logistics
- Approaches to using artificial intelligence in production and logistics
- Further methods, techniques and applications

### **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students are able to:

- Recognize and classify the importance of logistics for the successful management of manufacturing companies
- To capture, understand, analyze and optimize companies and value chains in production and logistics methodically and comprehensively
- Be familiar with essential information and communication systems in production and logistics and understand their purposes
- Understand important functions of information and communication systems in production and logistics

## Reading list

**Kummer, Sebastian, Werner Jammernegg und Oskar Grün. 2013.** Grundzüge der Beschaffung, Produktion und Logistik. 3., aktualisierte Auflage. München: Pearson Studium.

**Schönsleben, Paul. 2016.** Integrales Logistikmanagement: Operations und Supply Chain Management innerhalb des Unternehmens und unternehmensübergreifend. 7. Aufl. Berlin, Heidelberg: Springer-Verlag.

**Wannenwetsch, Helmut. 2010.** Integrierte Materialwirtschaft und Logistik: Beschaffung, Logistik, Materialwirtschaft und Produktion. 4. Aufl. Springer-Lehrbuch. Berlin Heidelberg: Springer-Verlag.

Available on the WWW for members of the Augsburg University of Applied Sciences  
(from the university network, also via VPN)  
<http://www.springer.com/de/book/9783662483336>

Interactive examples and exercises for the book at  
<http://www.intlogman.lim.ethz.ch/>



## 2.16 Business Modelling

### Information about the module

engl. Name	Business Modelling
Code	BMO
Coordinator	Prof. Dr. Claudia Reuter
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, summer semester
Courses	Business Modelling (4 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar format, practical work
Prerequisites	Introduction to Information Systems and Programming 1 of Semester 1 and 2 (recommended)
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 4, CP credits: 5, Contact hours: 60h, Independent study: 90h, Total workload: 150h

### Exam

Type of exam / required course achievements	Written examination, 60 minutes, carried out as electronic examination auxiliary: lecture notes, literature cited
Examination number ( according to SPO no. 6.3 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

The module provides participants with basic knowledge in the areas of business and software modelling.

Introduction to business and software modelling

- Properties of models
- Expectations of models
- Types of models and forms of documentation

Target modelling

- Hierarchical decomposition
- Impact mapping

Process modelling with BPMN

- BPMN process diagrams
- BPMN Collaborations
- BPMN event handling

Requirements engineering and system design

- Basics of Requirements Engineering
- System delimitation
- Eliciting requirements
- Documenting requirements textually
- Model-based documentation with UML (use case diagrams, activity diagrams, class diagrams, state diagrams, sequence diagrams)

## **Qualification aims for the module learning objectives/skills**

After successful participation in the module, students are able to:

- select and apply established modelling concepts
- develop business process models according to BPMN
- apply requirements engineering techniques
- design simple SW systems with UML
- assess the quality of models
- know a tool for creating models

## Reading list

- Bisset, M., Adzic, G.:** Impact Mapping: Making a Big Impact with Software Products and Projects, Provoking Thoughts, 2012
- Silver, B.:** BPMN Method and Style, 2. Auflage, Cody-Cassidy Press, 2011
- Pohl, K., Rupp, C.:** Basiswissen Requirements Engineering, 3. Auflage, dpunkt.verlag GmbH, 2011
- Cohn, M.:** User Stories Applied: For Agile Software Development, Addison-Wesley Professional, 2004
- Patton, J.:** User Story Mapping: Discover the Whole Story, Build the Right Product, O'Reilly and Associates, 2014
- Kecher, C., Salvanos, A.:** UML 2.5: Das umfassende Handbuch, 6. Auflage, Rheinwerk Computing, 2017
- Grässle, P., Baumann, H., Baumann, P.:** UML projektorientiert. Geschäftsprozessmodellierung, IT-System-Spezifikation und Systemintegration mit UML, Galileo Press, 2003





## 2.17 Seminar New Technologies

### Information about the module

engl. Name	Seminar New Technologies
Code	
Coordinator	Professors of the Faculty of Computer Science
Faculty	Faculty of Computer Science
Type	Compulsory Module
Duration / Frequency	1 semester, winter semester
Courses	Seminar New Technologies (2 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 2, CP credits: 5, Contact hours: 30h, Independent study: 120h, Total workload: 150h

### Exam

Type of exam / required course achievements	Portfolio exam: <ul style="list-style-type: none"><li>• Written assignment, 10-20 pages, 50%</li><li>• Oral examination, 20-40 minutes, 50%</li></ul>
Examination number ( according to SPO no. 6.4 )	
Grading	According to § 20 of the APO in the currently valid version.

### Content of the module

Students carry out research on a topic relating to currently relevant technologies in the field of information systems and computer science. They document, present and discuss their results in plenary sessions.

### **Qualification aims for the module learning objectives/skills**

Students are familiar with the principles of scientific research, scientific writing and writing and presentation and are able to summarise information on subject-specific topics

- to collect,
- quote correctly and
- in their own words in writing and orally,

and to debate on specific topics.

### **Reading list**

Literature recommendations will be provided in the lecture.

## 2.18 Compulsory Elective Subjects

### Information about the module

engl. Name	Compulsory Elective Subjects
Code	PEE
Coordinator	Professors of the Faculty of Computer Science
Faculty	Faculty of Computer Science
Type	Required elective module
Duration / Frequency	1 semester, winter or summer semester
Courses	The required elective modules can be chosen from the offer of the Faculty of Computer Science.
Modul area	Intensification Phase
Teaching language	See details of the respective required elective module.
Teaching and learning methods	Seminar, Seminar format, practical work
Prerequisites	Information on participation in required elective modules can be found under §§ 3, 4, 5 of the study and examination regulations.
Usage possibilities	International Information Systems
Total workload and its constituent parts	CP: 28, Please take the credit hours for the subjects from the catalogue for the profile education elective modules (FWP catalogue).

### Exam

Type of exam / required course achievements	For more information on the subject-related required elective modules please visit the program's websites under Downloads and links.
Examination number ( according to SPO no. W.1 )	
Grading	According to § 20 of the APO in the currently valid version.

### Content of the module

Specific expertise in each module.

**Qualification aims for the module learning objectives/skills**

Further information on the subject-related compulsory elective subjects can be found on the website of the degree programme under Downloads relevant to studies.

**Reading list**

Literature will be announced in the respective courses.

## 2.19 General Science Elective Subjects

### Information about the module

engl. Name	General Science Elective Subjects
Code	AWP
Coordinator	Professors of the Faculty of Liberal Arts and Sciences
Faculty	Faculty of Liberal Arts and Sciences
Type	Required elective module
Duration / Frequency	1 semester, winter or summer semester
Courses	All courses offered at the Technical University of Applied Sciences Augsburg can be chosen as general science electives, provided they are not compulsory or elective subjects of this degree programme or are included in the exclusion list of the degree program.
Modul area	Intensification Phase
Teaching language	The module is taught in German and English.
Teaching and learning methods	The teaching and learning methods, as well as the teaching media used, vary depending on the course.
Prerequisites	Information on participation in compulsory elective subjects can be found under §§ 6 and 7 of the study and examination regulations.
Usage possibilities	International Information Systems
Total workload and its constituent parts	CP: 2, Please look at the module catalogue of the Faculty of Liberal Arts and Sciences.

### Exam

Type of exam / required course achievements	The type and duration of the examination varies depending on the course and can be found in the module catalogue of the Faculty of Liberal Arts and Sciences.
Examination number	( according to SPO no. W.2 )
Grading	According to § 20 of the APO in the currently valid version.

### **Content of the module**

The general science program at the Technical University of Applied Sciences Augsburg includes a wide range of subjects in the humanities, social sciences and natural sciences subjects. Students learn about areas of knowledge that go beyond their subject-specific studies.

### **Qualification aims for the module learning objectives/skills**

To a certain extent, the general science electives represent a "Studium generale". Students are able to apply the theoretical knowledge they have acquired in their studies and profession.

### **Weighting of individual performance in the final grade**

The type and duration of the examination varies depending on the course and can be found in the module catalogue of the Faculty of Liberal Arts and Sciences.

### **Reading list**

The literature list can be found in the module catalogue of the Faculty of Liberal Arts and Sciences.

## 2.20 Bachelor Thesis

### Information about the module

engl. Name	Bachelor Thesis
Code	BA
Coordinator	Professors of the Faculty of Computer Science
Faculty	Faculty of Computer Science
Type	Compulsory module
Duration / Frequency	1 semester, winter or/and summer semester
Courses	
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Bachelor Thesis
Prerequisites	Information on the Bachelor thesis can be found under § 12 of the study and examination regulations.
Usage possibilities	International Information Systems
Total workload and its constituent parts	ECTS: 12, Working hours: 360 h Processing time: 4 months

### Exam

Type of exam / required course achievements	Bachelor Thesis, 20-80 pages
Examination number ( according to SPO no. 7.1 )	
Grading	According to § 20 of the APO in the currently valid version.

### Content of the module

For the Bachelor's thesis, an individual topic is assigned to each student by the examination board in accordance with §10 of the SPO.



**Qualification aims for the module learning objectives/skills**

See §10 of the study examination regulations.

**Reading list**

Technical literature on the chosen topic.

## 2.21 Bachelor Seminar

### Information about the module

engl. Name	Bachelor Seminar
Code	
Coordinator	Professors of the Faculty of Computer Science
Faculty	Faculty of Computer Science
Type	Compulsory Module
Duration / Frequency	The duration of the module is one semester. The module is regularly offered in both the summer and winter semesters.
Courses	Bachelor Seminar (2 Credit hours)
Modul area	Intensification Phase
Teaching language	The module is taught in English or in German.
Teaching and learning methods	Seminar
Prerequisites	None
Usage possibilities	International Information Systems
Total workload and its constituent parts	Credit hours: 2, CP credits: 2, Contact hours: 30h, Independent study: 30h, Total workload: 60h

### Exam

Type of exam / required course achievements	Oral examination, 30 minutes
Examination number ( according to SPO no. 7.2 )	
Grading	According to § 20 of the APO in the currently valid version.

## **Content of the module**

### Presentation of the Bachelor thesis

The lecturer supervising the Bachelor's thesis is also the lecturer for the Bachelor's seminar. The organisation and content of the Bachelor's seminar is determined by the respective lecturer. In terms of content, the Bachelor's seminar can cover both academic work and specialised topics from the Bachelor's thesis environment. Registration takes place automatically with the registration of the Bachelor's thesis.

## **Qualification aims for the module learning objectives/skills**

The student is able to

- present his/her own work correctly and comprehensibly according to scientific standards and answer questions.
- understand presentations on other Bachelor's theses and participate in technical discussions.

## **Reading list**

It is recommended to use the services of the university library at the beginning of the seminar, in particular for "research" and "citation". You can check the current seminar dates on the following website:

**Seminare - Recherchieren, Wissenschaftliches Arbeiten, Zitieren und Literatur-/Wissensverwaltung: all das können Sie in unseren Bibliotheksseminaren an der Hochschule Augsburg lernen.**

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