

Module Catalogue

»Courses in English«



Last updated: April 16, 2025

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 Study Program: Computer Science - Bachelor's Degree

1.1 Project Work 1

Name

Projektarbeit 1 / Project Work 1

Code

PA1

Coordinator

Director of studies

Teaching language

German/English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Project Work 1 (6 credit hours)

Teaching and learning methods

Project Work

Exam

Examination number

3975450

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 10-30 Seiten, 80%
- Presentation, 20-40 minutes, 20%

Additional Information

Prerequisites

Content of the module

Over the course of one semester, the project work is made up of the following items of work (attendance at each event is compulsory):

- Project management event (kick-off seminar at the beginning of the semester)
- Participation in the project meetings (usually on a weekly basis)
- Project presentation event (e.g. project day including colloquium at the end of the semester)
- Project implementation

Qualification aims for the module learning objectives/skills

The students acquire the skills required to carry out an IT project. The students acquire knowledge of project organisation and implementation, other presentation, teamwork, scientific writing and debate culture skills as well as experience with project management tools.

Reading list

1.2 Project Work 2

Name

Projektarbeit 2 / Project Work 2

Code

PA2

Coordinator

Director of studies

Teaching language

German/English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 8, CP credits: 10,

Contact hours: 120h, Independent study: 180h, Total workload: 300h

Courses

Project Work 2 (8 credit hours)

Teaching and learning methods

Project Work

Exam

Examination number

3975450

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 10-30 Seiten, 80%
- Presentation, 20-40 minutes, 20%

Additional Information

Prerequisites

Content of the module

Over the course of one semester, the project work is made up of the following items of work (attendance at each event is compulsory):

- Project management event (kick-off seminar at the beginning of the semester)
- Participation in the project meetings (usually on a weekly basis)
- Project presentation event (e.g. project day including colloquium at the end of the semester)
- Project implementation

Qualification aims for the module learning objectives/skills

The students acquire the skills required to carry out an IT project. The students acquire knowledge of project organisation and implementation, other presentation, teamwork, scientific writing and debate culture skills as well as experience with project management tools.

Reading list

2 Study Program: Business Information Systems - Bachelor's Degree

2.1 Customizing

Name

Customizing / Customizing

Code

CUST

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Customizing of Information Systems (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Grading

Examination number

3975460

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written examination, 60 minutes, with authorized lecture material, 50%
- Project work, 10-30 pages and 10-30 minutes presentation, 50%

Additional Information

Prerequisites

None

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 (structures, master data, transaction data)
- 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 and ES management. Here among other topics, the necessary steps to configure/customize an ERP system such as SAP S/4 HANA and concepts such as master data management and lifecycle management 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 ES Implementations and of ES Management
- Configure/customize core features of the SAP S/4 HANA System

Reading list

Literature recommendations will be provided in the first lecture.

2.2 IT Applications Seminar

Name

DVA Seminar / IT Applications Seminar

Code

DVASEM

Coordinator

Director of studies

Teaching language

German/English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 3,

Contact hours: 30h, Independent study: 60h, Total workload: 90h

Courses

IT Applications Seminar (2 credit hours)

Teaching and learning methods

In this course, you choose one specific topic from the numerous subject areas offered by various lecturers. This usually takes place at the end of the previous semester although in some cases this may take place during a brief introductory session. Registration takes place online and is binding. Attendance is compulsory and active participation (discussion, colloquium) is expected

Exam

Examination number

3975610

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 5-15 pages, 70%
 - Presentation, 15-30 minutes, 30%
-

Additional Information

Prerequisites

Content of the module

The aim of this seminar is to promote the autonomous development of in-depth knowledge of a topic that has been studied as part of the subject area on offer, as well as active participation in the form of individual presentations and other related contributions. Each participant summarises the findings of the seminar and makes a presentation on them.

Qualification aims for the module learning objectives/skills

The students acquire detailed knowledge of the chosen subject area as well as advanced skills in the fields of academic work, presentation techniques and elocution.

Reading list

2.3 Project 1

Name

Projekt 1 / Project 1

Code

PRO1

Coordinator

Director of studies

Teaching language

German/English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 8,

Contact hours: 60h, Independent study: 180h, Total workload: 240h

Courses

Project Work 1 (4 credit hours)

Teaching and learning methods

Project Work

Exam

Examination number

3975450

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 10-30 Seiten, 80%
- Presentation, 20-40 minutes, 20%

Additional Information

Prerequisites

Content of the module

Over the course of one semester, the project work is made up of the following items of work (attendance at each event is compulsory):

- Project management event (kick-off seminar at the beginning of the semester)
- Participation in the project meetings (usually on a weekly basis)
- Project presentation event (e.g. project day including colloquium at the end of the semester)
- Project implementation

Qualification aims for the module learning objectives/skills

The students acquire the skills required to carry out an IT project. The students acquire knowledge of project organisation and implementation, other presentation, teamwork, scientific writing and debate culture skills as well as experience with project management tools.

Reading list

2.4 Project 2

Name

Projekt 2 / Project 2

Code

PRO2

Coordinator

Director of studies

Teaching language

German/English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 8,

Contact hours: 60h, Independent study: 180h, Total workload: 240h

Courses

Project Work 2 (4 credit hours)

Teaching and learning methods

Project Work

Exam

Examination number

3975450

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 10-30 Seiten, 80%
- Presentation, 20-40 minutes, 20%

Additional Information

Prerequisites

Content of the module

Over the course of one semester, the project work is made up of the following items of work (attendance at each event is compulsory):

- Project management event (kick-off seminar at the beginning of the semester)
- Participation in the project meetings (usually on a weekly basis)
- Project presentation event (e.g. project day including colloquium at the end of the semester)
- Project implementation

Qualification aims for the module learning objectives/skills

The students acquire the skills required to carry out an IT project. The students acquire knowledge of project organisation and implementation, other presentation, teamwork, scientific writing and debate culture skills as well as experience with project management tools.

Reading list

3 Study Program: Computer Science - Master's Degree

3.1 Master's Seminar

Name

Masterseminar / **Master's Seminar**

Code

MASEM

Coordinator

Prof. Dr. Phil. Alessandra Zarcone

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester, summer semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,

Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Master's seminar (2 credit hours)

Teaching and learning methods

The topics are announced in advance so that every student who is interested in the module can sign up online, select a topic and do their own research.

The students are required to submit an exposé in the first part of the semester and to give a presentation in one of the planned slots. Each presentation is followed by a discussion where the students discuss possible open questions. A critical but productive approach towards one's own work and the peers' work is encouraged.

The students submit an article summarizing their results at the end of the course.

Exam

Examination number

8900110

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 10 - 20 pages, 70%
- Oral examination, 20 minutes, 30%

Additional Information

Prerequisites

Module Workshop (WSH)

Usage possibilities

Master's degree Computer Science

Content of the module

The aim of the master's seminar is to promote autonomous research work on a particular topic.

The students expand their knowledge and understanding of the chosen topic and investigate the methodology, potential critical points and open questions. They summarise the results in a long abstract and then present the results to the class. The students review their peers's work and adopt a critical approach towards their own work. The content of all presentations is thematically related to encourage discussion. Each student submits a paper on the chosen topic.

We strongly recommend attending the Workshop "Introduction to Scientific Research" before the Masterseminar.

Qualification aims for the module learning objectives/skills

The students have refined their critical insights and have developed their scientific writing and presentation skills.

They are able to

- research a chosen topic
- structure and write a scientific publication
- apply common-practice scientific methodologies
- analyze and discuss research results
- identify weak points and strength of scientific publications and provide feedback to their peers

Reading list

3.2 Workshop

Name

Workshop / Workshop

Code

WSH

Coordinator

Prof. Dr.-Phil. Alessandra Zarcone

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester, summer semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,

Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Workshop (2 credit hours)

Teaching and learning methods

Seminar format with practical exercises

Exam

Examination number

8900100

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 3 - 5 pages, 60%
- Oral examination, 20 minutes, 40%

Additional Information

Prerequisites

None

Usage possibilities

Master's degree Computer Science

Content of the module

We will cover different aspects and tools of a researcher's everyday work, in particular:

- Research methods and evaluation of statistical models
- Documentation of data collection
- Ethical aspects
- Scientific Writing
- Bibliographic search and citing the sources
- Presentation of scientific writing (talks and posters)
- Critical approach to one's own scientific work and to the literature and peer review
- Networking and promoting your work

At the beginning of the course the students are assigned one paper each. The papers are announced in advance so that every student who is interested in the module can sign up online and select a paper. The students are required to critically analyze the paper regarding the aspects covered by the course, to compile a review of the paper regarding these aspects and to prepare a poster presenting the content of the paper.

At the end of the course the students present the papers in a poster session and are required to actively participate in the discussion of at least two more posters.

We strongly recommend attending the Workshop at the beginning of your Master (1st or 2nd semester).

Qualification aims for the module learning objectives/skills

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

- Critically review existing research work
- Plan their own research work
- Carry out their own research by adopting standard practice methods
- Present their own work in an accurate and effective way

Reading list

Booth, Wayne C, et al. The Craft of Research: University of Chicago Press, 4. edition, (2016)

More material (videos, papers) will be provided during the course.

Software:

- LaTeX: <https://www.latex-project.org>

4 Study Program: Business Information Systems - Master's Degree

4.1 Master's Seminar

Name

Masterseminar / **Master's Seminar**

Code

MSEM

Coordinator

Prof. Dr. Jana Görmer-Redding

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,

Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Master's seminar (2 credit hours)

Teaching and learning methods

Seminar, seminar-based teaching

Exam

Examination number

8004091

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolioprüfung:

1. Practical examination, workload: max. 22h, passed
2. Written assignment, 8-12 pages, 60%
3. Presentation, 25 minutes, 40%

Additional information on the type of examination

The grade for the module is calculated from the partial performances as follows

- If the first part is not passed, the module is deemed to have been failed.
 - If the first part is passed, the module grade is calculated from the grades of the second and third part with the following weighting
 - Written assignment: 60%
 - Presentation: 40%
-

Additional Information

Prerequisites

Module Workshop

Usage possibilities

Master's degree Business Information Systems

Content of the module

The aim of the Master's seminar is to conduct independent academic research on a specific topic.

Students expand their knowledge and understanding of the chosen topic. They create an exposé with a matrix of methods and a timetable. They can formulate research questions and research hypotheses from a topic and work out possible critical points and open questions. You will summarize the results of the literature research with use case and, if applicable, prototypical implementation and can interpret these using statistical methods.

They create a short summary (abstract) and present the results in groups and give each other feedback. and give each other feedback. The students review the abstracts and presentations of their fellow students and revise their own work with a critical approach.

The contents of all presentations are thematically related. (Own topics can also be chosen after clarification or given topics can be adapted). Discussion and academic debates are encouraged.

Students submit a written paper on the chosen topic and defend it.

In the course of the seminar, students are expected to develop their scientific methods – abstract, research questions/hypotheses, exposé, method matrix, writing methodology – and improve their scientific texts and presentation skills.

In addition, you should deepen the knowledge you have acquired through self-directed learning. This also includes presentation, argumentation as well as group and individual work.

Qualification aims for the module learning objectives/skills

After successfully completing the module, students are able to

- to independently prepare scientific papers on topics of business informatics
- present their own results and analyze the results of others
- evaluate scientific literature
- to apply the necessary presentation and discussion techniques
- to research a selected topic
- to structure a scientific publication
- apply common scientific methods
- analyze and evaluate research results
- identify weaknesses and strengths of scientific publications
- Express feedback on a scientific paper

Reading list

Literature on scientific work:

- Zobel, Justin: Writing for Computer Science. 3rd Edition, Springer 2014
- Janert, Philipp K.: Gnuplot in Action. Understanding Data with Graphs, 2nd Edition, Manning Publications 2016
- Links to the topic "Abstract":
 - <https://plg.uwaterloo.ca/~migod/research/beckOOPSLA.html>
 - <https://www.microsoft.com/en-us/research/wp-content/uploads/2016/08/giving-a-talk.pdf>
- Links to the topic "scientific writing":
 - <https://www.cs.cmu.edu/afs/cs.cmu.edu/user/mleone/web/how-to.html>
 - <https://www.ece.ucdavis.edu/~jowens/commonerrors.html>
 - <https://www.cs.columbia.edu/~hgs/etc/writing-bugs.html>
- Links to the topic "CORE ranking & Conference acceptance rates":
 - <https://portal.core.edu.au/conf-ranks/>
 - <https://www.cs.ucsb.edu/~almeroth/conf/stats/>
- Links to the topic \LaTeX :
 - <https://quarto.org/docs/get-started/>
 - <https://www.dante.de/installation-und-informationen-fuer-beginner/>
 - <https://editor.codecogs.com/>
 - <http://www.ctan.org/>
 - Perl-Interpreter required, e.g., <https://strawberryperl.com/>
 - <http://www.gnuplot.info>

4.2 Project Work

Name

Projektarbeit / Project Work

Code

PROAR

Coordinator

Director of studies

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,

Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Project Work (2 credit hours)

Teaching and learning methods

Project work, regular project status meetings, project-related tuition in blocks of seminars, coaching.

Exam

Examination number

8004092

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 20-40 Seiten, 80%
- Presentation, 20-40 minutes, 20%

Additional Information

Prerequisites

No specific master's modules.

Content of the module

The project tasks covered in this module derive from specific, practical implementation projects that are carried out by the companies of today. The intention here is to establish practical collaboration with companies. The students organise themselves into project teams, analyse the commercial issues, draft potential alternative solutions and make the decision as to which approach to take. Once the framework is in place, the implementation stage begins based on this decision.

Qualification aims for the module learning objectives/skills

The students master the planning and execution of a system implementation project by selecting and applying appropriate project management techniques.

Reading list

5 Study Program: International Information Systems Bachelor SPO2021 - Bachelor's Degree

5.1 International Information Systems Bachelor - 1. Semester

5.1.1 1st Foreign Language

Name

1. Fremdsprache / 1st Foreign Language

Code

FL1

Coordinator

Prof. Dr. Svea Schauffler

Teaching language

The module is usually taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

1st Foreign Language (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770010

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Presentation, 10-20 minutes, 20%
- Oral examination, 10-20 minutes, 20%
- Written examination, 90 minutes, none auxiliaries, 60%

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.

5.1.2 Mathematics 1

Name

Mathematik 1 / Mathematics 1

Code

MAT1

Coordinator

Prof. Dr. Caroline Justen

Teaching language

The module is taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Mathematics 1 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770020

Grading

According to § 20 of the APO in the currently valid version.

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)

Additional Information

Usage possibilities

The topics are relevant for the mathematics 2 module

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.

5.1.3 Programming 1

Name

Programmieren 1 / Programming 1

Code

PRG1

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 1 (4 Credit hours)

Practical work Programming 1 (2 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770030

Grading

According to § 20 of the APO in the currently valid version.

Admission requirement for the examination

Practical work Programming 1

Type of exam / required course achievements

Electronic examination, 60 minutes, Auxiliaries: Development environment, authorized lecture and exercise materials, Java API documentation, Moodle

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.

5.1.4 Introduction to Business Administration, Financial Accounting

Name

Grundlagen der BWL, Buchführung und Bilanzierung / Introduction to Business Administration, Financial Accounting

Code

IBA

Coordinator

Prof. Dr. Stephan Zimmermann

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Introduction to Business Administration, Financial Accounting (6 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770040

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, auxiliary: calculator, 1 DIN A4 sheet (front and back) with handwritten, personal lecture summary

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

5.1.5 2nd Foreign Language 1 of 4

Name

2. Fremdsprache 1 von 4 / 2nd Foreign Language 1 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 1 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9771XXX

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

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.

5.2 International Information Systems Bachelor - 2. Semester

5.2.1 Database Systems

Name

Datenbanksysteme / Database Systems

Code

DBS

Coordinator

Prof. Matthias Kolonko, Ph.D. (ONPU)

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Database Systems (4 Credit hours)

Practical work Database Systems (2 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770050

Grading

According to § 20 of the APO in the currently valid version.

Admission requirement for the examination

Practical work Database Systems

Type of exam / required course achievements

Written examination, 90 minutes, none auxiliaries

As an alternative to the written exam, 3 interim tests can be handed in that will be summarized as one final grade.

After having chosen to hand in the 3 interim tests, it is not possible to switch back to the written exam at the end of the particular semester.

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) and suitable physical data structures are 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 3 interim tests (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)

5.2.2 2nd Foreign Language 2 of 4

Name

2. Fremdsprache 2 von 4 / 2nd Foreign Language 2 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 2 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9771XXX

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

Additional Information

Prerequisites

The module 2nd Foreign Language 2 of 4 builds on the 2nd Foreign Language 1 from 4 and is assumed. (recommended)

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.

5.2.3 Introduction to Information Systems

Name

Grundlagen der Wirtschaftsinformatik / Introduction to Information Systems

Code

ISY

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Introduction to Information Systems (3 Credit hours)

Practical work Introduction to Information Systems (1 Credit hour)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770060

Grading

According to § 20 of the APO in the currently valid version.

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

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 common 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

5.2.4 Programming 2 & Software Engineering

Name

Programmieren 2 & Software Engineering / Programming 2 & Software Engineering

Code

PRG2

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 2 & Software Engineering (4 Credit hours)

Practical work Programming 2 & Software Engineering (2 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770070

Grading

According to § 20 of the APO in the currently valid version.

Admission requirement for the examination

Practical work Programming 2 & Software Engineering

Type of exam / required course achievements

Electronic examination, 60 minutes, Auxiliaries: Development environment, authorized lecture and exercise materials, Java API documentation, Moodle

Additional Information

Prerequisites

Module Programming 1 (recommended)

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.

5.2.5 Mathematics 2

Name

Mathematik 2 / Mathematics 2

Code

MAT2

Coordinator

Prof. Dr. Caroline Justen

Teaching language

The module is taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Mathematics 2 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9770080

Grading

According to § 20 of the APO in the currently valid version.

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)

Additional Information

Prerequisites

Module Mathematics 1 (recommended)

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.

5.3 International Information Systems Bachelor - 3. Semester

5.3.1 Customizing of Information Systems

Name

Customizing von Informationssystemen / Customizing of Information Systems

Code

CUST

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Customizing of Information Systems (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772030

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written examination, 60 minutes, with authorized lecture material, 50%
- Project work, 10-30 pages and 10-30 minutes presentation, 50%

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 (structures, master data, transaction data)
- 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 and ES management. Here among other topics, the necessary steps to configure/customize an ERP system such as SAP S/4 HANA and concepts such as master data management and lifecycle management 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 ES Implementations and of ES Management
- Configure/customize core features of the SAP S/4 HANA System

Reading list

Literature recommendations will be provided in the first lecture.

5.3.2 E-Business

Name

E-Business / E-Business

Code

EBUS

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

E-Business (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772040

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

Additional Information

Prerequisites

None; recommended: Introduction to business administration

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

- You will learn about the relevant underlying technologies and be able to discuss the potential of e-business.
- You will gain an overview of the most important types of e-business, the digital product architecture and understand the core requirements.
- You will be familiar with the concept of the e-company and be able to distinguish how companies can work together on the basis of Internet-based communication.
- You will get to know the types of e-commerce and be able to discuss them.
- You can understand and work out integration patterns for online stores.
- You understand how exchange and business can take place via e-communities and can develop a communication concept for the use of e-communities.

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

5.3.3 2nd Foreign Language 3 of 4

Name

2. Fremdsprache 3 von 4 / 2nd Foreign Language 3 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 3 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9771XXX

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

Additional Information

Prerequisites

The module 2nd Foreign Language 3 of 4 builds on the 2nd Foreign Language 2 and 1 from 4 and is assumed. (recommended)

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.

5.3.4 Programming of Information Systems

Name

Programmierung von Informationssystemen / Programming of Information Systems

Code

PRG3

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 3 (4 Credit hours)

Practical work Programming 3 (2 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772020

Grading

According to § 20 of the APO in the currently valid version.

Admission requirement for the examination

Practical work Programming of Information Systems

Type of exam / required course achievements

Electronic examination, 60 minutes, Auxiliaries: SAP, authorized lecture and exercise materials, Moodle

Additional Information

Prerequisites

Programming 1 (recommended)

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.

5.3.5 Statistics

Name

Statistik / Statistics

Code

STAT

Coordinator

Prof. Dr. Phil. Alessandra Zarcone

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Statistics (4 Credit hours)

Teaching and learning methods

Seminar format with practical exercises

Exam

Examination number

9772010

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, 2 DIN A4 page handwritten list of R functions, statistics software (R) on own laptop

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/>

5.4 International Information Systems Bachelor - 4. Semester

5.4.1 Data Analytics

Name

Datenanalyse / Data Analytics

Code

DAT

Coordinator

Prof. Dr. Wolfgang Kratsch

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Data Analytics (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772050

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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.

5.4.2 2nd Foreign Language 4 of 4

Name

2. Fremdsprache 4 von 4 / 2nd Foreign Language 4 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 4 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9771XXX

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

Additional Information

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)

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.

5.4.3 Intercultural Management & Law

Name

Interkulturelles Management & Recht / Intercultural Management & Law

Code

IML

Coordinator

Prof. Dr. Svea Schauffler
Frank Falker, LL.M.

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Intercultural Management & Law (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772090

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Electronic examination, 120 minutes, Intercultural Management: none auxiliaries; Law: auxiliary Collection of laws

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.

5.4.4 International IT Project and Service Management

Name

Internationales IT Projekt und Service Management / International IT Project and Service Management

Code

IPSM

Coordinator

Prof. Dr. Clemens Espe, MBA

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

(4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772070

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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

5.4.5 Team Project

Name

Teamprojekt / Team Project

Code

PROJ

Coordinator

Prof. Dr. Stephan Zimmermann (Director of Studies)

Teaching language

The module is taught in English and in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 8,

Contact hours: 60h, Independent study: 180h, Total workload: 240h

Courses

Team Project (4 Credit hours)

Teaching and learning methods

Project work, Seminar

Exam

Examination number

9774020

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 10-30 Seiten, 80%
- Presentation, 20-40 minutes, 20%

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.

5.5 International Information Systems Bachelor - 5. Semester

5.5.1 Integrated Semester in Industry

Name

Praktische Tätigkeit / Integrated Semester in Industry

Code

PRAC

Coordinator

Advisor for Internship

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

ECTS: 20, Total workload: 20 weeks

Courses

Integrated Semester in Industry (20 weeks)

Teaching and learning methods

Practical work

Exam

Examination number

9773010

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Practical report, 20-50 pages

Additional Information

Prerequisites

The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.

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.

5.5.2 Practical Seminar

Name

Praxisseminar / **Practical Seminar**

Code

PSEM

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 2,
Contact hours: 30h, Independent study: 30h, Total workload: 60h

Courses

Practical Seminar (2 Credit hours)

Teaching and learning methods

Seminar

Exam

Examination number

9773020

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Presentation, 15-30 minutes

Additional Information

Prerequisites

The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.

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.

5.5.3 Cost Accounting, Controlling & Financial Management

Name

Kosten- und Leistungsrechnung, Controlling & Finanzmanagement / Cost Accounting, Controlling & Financial Management

Code

COF

Coordinator

Prof. Dr. Jana Görmer-Redding

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Cost Accounting, Controlling & Financial Management (6 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9773030

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, auxiliary: non-programmable calculator, 1 DIN A4 sheet (front and back) with handwritten, personal lecture summary

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.

5.6 International Information Systems Bachelor - 6. Semester

5.6.1 Applied Artificial Intelligence

Name

Angewandte Künstliche Intelligenz / **Applied Artificial Intelligence**

Code

AAI

Coordinator

Prof. Dr. Wolfgang Kratsch

Prof. Dr. Björn Häckel

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Applied Artificial Intelligence (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9774010

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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

5.6.2 Business Modelling

Name

Geschäftsmodellierung / Business Modelling

Code

BMO

Coordinator

Prof. Dr. Claudia Reuter

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Business Modelling (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772060

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Electronic examination, 60 minutes, auxiliary: lecture notes, angegebene Literatur

Additional Information

Prerequisites

Introduction to Information Systems and Programming 1 of Semester 1 and 2 (recommended)

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

5.6.3 Production and Logistics

Name

Produktion und Logistik / Production and Logistics

Code

PROLO

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Production and Logistics (4 Credit hours)

Teaching and learning methods

Seminar format, practical class and workshop, practical work

Exam

Examination number

9772080

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Electronic examination, 60 minutes, auxiliary: calculator

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
- Aspects of sustainability, resource management and environmental protection in production processes

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 Jammerneegg und Oskar Grün: Grundzüge der Beschaffung, Produktion und Logistik. 3., aktualisierte Auflage. München: Pearson Studium, 2013.

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

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

Tate, W.: Definitive Guide to Supply Management and Procurement: The: Principles and Strategies for Establishing Efficient, Effective, and Sustainable Supply Management Operations, 1st edition, Pearson FT Press, 2019

Hopp, Wallace J., Spearman, Mark L.: Factory Physics, 3rd edition, Waveland Press, 2011

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/>

5.7 International Information Systems Bachelor - 7. Semester

5.7.1 Bachelor Thesis

Name

Bachelorarbeit / Bachelor Thesis

Code

BA

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or/and summer semester

Total workload and its constituent parts

ECTS: 12, Working hours: 360 h

Processing time: 4 months

Courses

Teaching and learning methods

Bachelor Thesis

Exam

Examination number

9050

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 20-80 pages

Additional Information

Prerequisites

Information on the Bachelor thesis can be found under § 12 of the study and examination regulations.

Content of the module

Qualification aims for the module learning objectives/skills

Reading list

Technical literature on the chosen topic.

5.7.2 Scientific Research Methods for Information Systems

Name

Wissenschaftliche Methoden der Wirtschaftsinformatik / **Scientific Research Methods for Information Systems**

Code

SRM

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or/and summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Scientific Research Methods for Information Systems (4 Credit hours)

Teaching and learning methods

Seminar

Exam

Examination number

9774030

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 5-15 pages, 50%
- Presentation A, 15-30 minutes, 20%
- Presentation B, 15-30 minutes, 30%

Additional Information

Prerequisites

The bachelor seminar is conducted in preparation for and accompanying the bachelor thesis

Content of the module

The aim is to introduce students to a suitable scientific methodology in preparation for and during the Bachelor's thesis. The focus is on the independent development of in-depth knowledge as well as active engagement in the context of individual presentations with further contributions to this. In preparation for the Bachelor's thesis, students work on a completed topic area and summarise their results in a study paper as well as in a presentation (A). Accompanying the Bachelor thesis, questions, problems and solutions are discussed with the supervising professor. The progress and the results of the Bachelor thesis are to be presented in a presentation (B).

Qualification aims for the module learning objectives/skills

The students acquire detailed knowledge in the selected subject areas as well as extended competences in the areas of scientific work, presentation and rhetoric.

Reading list

5.8 Required Elective Modules

5.8.1 Profile Education Elective Modules

Name

Fachbezogene Wahlpflichtmodule / Profile Education Elective Modules

Code

PEE

Coordinator

Professors of the Faculty of Computer Science

Teaching language

See details of the respective required elective module.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or summer semester

Total workload and its constituent parts

Credit hours: 24, CP credits: 30,

Contact hours: 360h, Independent study: 540h, Total workload: 900h

Courses

The required elective modules can be chosen from the offer of the Faculty of Computer Science.

Teaching and learning methods

Seminar, Seminar format, practical class and workshop, practical work

Exam

Examination number

Grading

According to § 20 of the APO in the currently valid version.

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.

Additional Information

Prerequisites

Information on participation in required elective modules can be found under §§ 3, 4, 5 of the study and examination regulations.

Content of the module

Specific expertise in each module.

Qualification aims for the module learning objectives/skills

Specific expertise in each module.

Reading list

6 Study Program: International Information Systems Bachelor SPO2024 - Bachelor's Degree

6.1 Orientation Phase

6.1.1 Programming 1

Name

Programmieren 1 / Programming 1

Code

1.1

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 1 (4 Credit hours)

Practical work Programming 1 (2 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870010 (according to SPO no 1.1)

Grading

According to § 20 of the APO in the currently valid version.

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

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.

6.1.2 1st Foreign Language

Name

1. Fremdsprache / 1st Foreign Language

Code

1.2

Coordinator

Prof. Dr. Svea Schauffler

Teaching language

The module is usually taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

1st Foreign Language (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870030 (according to SPO no 1.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Oral examination A, 10-20 minutes, 20%
- Oral examination B, 10-20 minutes, 20%
- Written examination, 90 minutes, none auxiliaries, 60%

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.

6.1.3 Mathematics 1

Name

Mathematik 1 / Mathematics 1

Code

1.3

Coordinator

Prof. Dr. Caroline Justen

Teaching language

The module is taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Mathematics 1 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870040 (according to SPO no 1.3)

Grading

According to § 20 of the APO in the currently valid version.

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)

Additional Information

Usage possibilities

The topics are relevant for the mathematics 2 module

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.

6.1.4 Introduction to Business Administration, Financial Accounting

Name

Grundlagen der BWL, Buchführung und Bilanzierung / Introduction to Business Administration, Financial Accounting

Code

1.4

Coordinator

Prof. Dr. Stephan Zimmermann

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 7,

Contact hours: 90h, Independent study: 120h, Total workload: 210h

Courses

Introduction to Business Administration, Financial Accounting (6 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870050 (according to SPO no 1.4)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, auxiliary: calculator, 1 DIN A4 sheet (front and back) with handwritten, personal lecture summary

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

6.1.5 2nd Foreign Language 1 of 4

Name

2. Fremdsprache 1 von 4 / 2nd Foreign Language 1 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 1 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9871XXX (according to SPO no 1.5)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

In the foreign language German Portfolio exam:

- Written examination, 30-90 minutes, 60%
- Oral examination, 10-40 minutes, 40%

In the foreign languages French, Italian and Spanish Portfolio exam:

- Written examination, max. 60 minutes, 20%
- Oral examination, max. 20 minutes, 20%
- Written assignment, 2000 words, max. 9 pages, 30%
- project work (workload: max. 15 h, in the form of a simulation), 30%

In the foreign language Chinese Portfolio exam:

- Written examination, max. 60 minutes, 50%
 - Oral examination, max. 20 minutes, 20%
 - Written assignment, 2000 words, max. 9 pages, 30%
-

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.

6.1.6 Mathematics 2

Name

Mathematik 2 / Mathematics 2

Code

2.1

Coordinator

Prof. Dr. Caroline Justen

Teaching language

The module is taught in English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Mathematics 2 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870060 (according to SPO no 2.1)

Grading

According to § 20 of the APO in the currently valid version.

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)

Additional Information

Prerequisites

Module Mathematics 1 (recommended)

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.

6.1.7 Programming 2 & Software Engineering

Name

Programmieren 2 & Software Engineering / Programming 2 & Software Engineering

Code

2.2

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 2 & Software Engineering (4 Credit hours)

Practical work Programming 2 & Software Engineering (2 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870070 (according to SPO no 2.2)

Grading

According to § 20 of the APO in the currently valid version.

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

Additional Information

Prerequisites

Module Programming 1 (recommended)

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.

6.1.8 Introduction to Information Systems

Name

Grundlagen der Wirtschaftsinformatik / Introduction to Information Systems

Code

2.3

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Introduction to Information Systems (3 Credit hours)

Practical work Introduction to Information Systems (1 Credit hour)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870090 (according to SPO no 2.3)

Grading

According to § 20 of the APO in the currently valid version.

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

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 common 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

6.1.9 Intercultural Management & Law

Name

Interkulturelles Management & Recht / Intercultural Management & Law

Code

2.4

Coordinator

Prof. Dr. Svea Schauffler
Frank Falker, LL.M.

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Intercultural Management & Law (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9870110 (according to SPO
no 2.4)

Grading

According to § 20 of the APO in the currently valid
version.

Type of exam / required course achievements

Written examination, 120 minutes, carried out as electronic examination
Intercultural Management: none auxiliaries; Law: auxiliary Collection of laws

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.

6.1.10 2nd Foreign Language 2 of 4

Name

2. Fremdsprache 1 von 4 / 2nd Foreign Language 2 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 2 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9871XXX (according to SPO no 2.5)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

In the foreign language German Portfolio exam:

- Written examination, 30-90 minutes, 60%
- Oral examination, 10-40 minutes, 40%

In the foreign languages French, Italian and Spanish Portfolio exam:

- Written examination, max. 60 minutes, 20%
- Oral examination, max. 20 minutes, 20%
- Written assignment, 2000 words, max. 9 pages, 30%
- project work (workload: max. 15 h, in the form of a simulation), 30%

In the foreign language Chinese Portfolio exam:

- Written examination, max. 60 minutes, 50%
 - Oral examination, max. 20 minutes, 20%
 - Written assignment, 2000 words, max. 9 pages, 30%
-

Additional Information

Prerequisites

The module 2nd Foreign Language 2 of 4 builds on the 2nd Foreign Language 1 from 4 and is assumed. (recommended)

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.

6.2 Intensification Phase

6.2.1 Statistics

Name

Statistik / Statistics

Code

3.1

Coordinator

Prof. Dr. Phil. Alessandra Zarcone

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Statistics (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872010 (according to SPO no 3.1)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, 2 DIN A4 page handwritten list of R functions, statistics software (R) on own laptop

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/>

6.2.2 Implementation of Enterprise Systems

Name

Implementation of Enterprise Systems / Implementation of Enterprise Systems

Code

3.2

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Customizing of Information Systems (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872020 (according to SPO no 3.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written examination, 60 minutes, auxiliaries: authorized lecture notes, 50%
- Practical examination (10-30 pages) and oral examination (10-30 minutes), 50%

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 (structures, master data, transaction data)
- 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 and ES management. Here among other topics, the necessary steps to configure/customize an ERP system such as SAP S/4 HANA and concepts such as master data management and lifecycle management 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 ES Implementations and of ES Management
- Configure/customize core features of the SAP S/4 HANA System

Reading list

Literature recommendations will be provided in the first lecture.

6.2.3 Database Systems

Name

Datenbanksysteme / Database Systems

Code

3.3

Coordinator

Prof. Matthias Kolonko, Ph.D. (ONPU)

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 7,

Contact hours: 90h, Independent study: 120h, Total workload: 210h

Courses

Database Systems (4 Credit hours)

Practical work Database Systems (2 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872030 (according to SPO no 3.3)

Grading

According to § 20 of the APO in the currently valid version.

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:

- written examination 1, 30 min
- written examination 2, 30 min
- written examination 3, 30 min

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)

6.2.4 Programming of Enterprise Systems

Name

Programming of Enterprise Systems / Programming of Enterprise Systems

Code

3.4

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Programming 3 (4 Credit hours)

Practical work Programming 3 (2 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872050 (according to SPO no 3.4)

Grading

According to § 20 of the APO in the currently valid version.

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

Additional Information

Prerequisites

Programming 1 (recommended)

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.

6.2.5 2nd Foreign Language 3 of 4

Name

2. Fremdsprache 1 von 4 / 2nd Foreign Language 3 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 3 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9871XXX (according to SPO no 3.5)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

In the foreign language German Portfolio exam:

- Written examination, 30-90 minutes, 60%
- Oral examination, 10-40 minutes, 40%

In the foreign languages French, Italian and Spanish Portfolio exam:

- Written examination, max. 60 minutes, 20%
- Oral examination, max. 20 minutes, 20%
- Written assignment, 2000 words, max. 9 pages, 30%
- project work (workload: max. 15 h, in the form of a simulation), 30%

In the foreign language Chinese Portfolio exam:

- Written examination, max. 60 minutes, 50%
 - Oral examination, max. 20 minutes, 20%
 - Written assignment, 2000 words, max. 9 pages, 30%
-

Additional Information

Prerequisites

The module 2nd Foreign Language 3 of 4 builds on the 2nd Foreign Language 2 and 1 from 4 and is assumed. (recommended)

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.

6.2.6 Data Analytics

Name

Datenanalyse / Data Analytics

Code

4.1

Coordinator

Prof. Dr. Wolfgang Kratsch

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Data Analytics (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872070 (according to SPO
no 4.1)

Grading

According to § 20 of the APO in the currently valid
version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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.

6.2.7 E-Business

Name

E-Business / E-Business

Code

4.2

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

E-Business (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872080 (according to SPO no 4.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

Additional Information

Prerequisites

None; recommended: Introduction to business administration

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

- You will learn about the relevant underlying technologies and be able to discuss the potential of e-business.
- You will gain an overview of the most important types of e-business, the digital product architecture and understand the core requirements.
- You will be familiar with the concept of the e-company and be able to distinguish how companies can work together on the basis of Internet-based communication.
- You will get to know the types of e-commerce and be able to discuss them.
- You can understand and work out integration patterns for online stores.
- You understand how exchange and business can take place via e-communities and can develop a communication concept for the use of e-communities.

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

6.2.8 International IT Project and Service Management

Name

Internationales IT Projekt und Service Management / International IT Project and Service Management

Code

4.3

Coordinator

Prof. Dr. Clemens Espe, MBA

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

(4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872090 (according to SPO
no 4.3)

Grading

According to § 20 of the APO in the currently valid
version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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

6.2.9 Project Work

Name

Project Work / Project Work

Code

4.4

Coordinator

Prof. Dr. Stephan Zimmermann (Director of Studies)

Teaching language

The module is taught in English and in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 8,

Contact hours: 60h, Independent study: 180h, Total workload: 240h

Courses

Project Work (2 SWS)

Teaching and learning methods

Project work, Seminar

Exam

Examination number

9872100 (according to SPO no 4.4)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 5-15 pages, 80%
- Oral examination, 5-30 minutes, 20%

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.

6.2.10 2nd Foreign Language 4 of 4

Name

2. Fremdsprache 1 von 4 / 2nd Foreign Language 4 of 4

Code

II2.FSxxx

Coordinator

Lecturers at the Faculty of Liberal Arts and Sciences

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

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

2nd Foreign Language 4 of 4 (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9871XXX (according to SPO no 4.5)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral and written parts according to the module specifications of the chosen language of the faculty of Liberal Arts and Sciences

In the foreign language German Portfolio exam:

- Written examination, 30-90 minutes, 60%
- Oral examination, 10-40 minutes, 40%

In the foreign languages French, Italian and Spanish Portfolio exam:

- Written examination, max. 60 minutes, 20%
- Oral examination, max. 20 minutes, 20%
- Written assignment, 2000 words, max. 9 pages, 30%
- project work (workload: max. 15 h, in the form of a simulation), 30%

In the foreign language Chinese Portfolio exam:

- Written examination, max. 60 minutes, 50%
 - Oral examination, max. 20 minutes, 20%
 - Written assignment, 2000 words, max. 9 pages, 30%
-

Additional Information

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)

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.

6.2.11 Internship

Name

Praktische Tätigkeit / Internship

Code

P.1

Coordinator

Advisor for Internship

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

ECTS: 20, Total workload: 20 weeks

Courses

Internship (20 weeks)

Teaching and learning methods

Practical work

Exam

Examination number

(according to SPO no P.1)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 20 pages

Additional Information

Prerequisites

The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.

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.

6.2.12 Practical Seminar

Name

Praxisseminar / **Practical Seminar**

Code

P.2

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 2,

Contact hours: 30h, Independent study: 30h, Total workload: 60h

Courses

Practical Seminar (2 Credit hours)

Teaching and learning methods

Seminar

Exam

Examination number

(according to SPO no P.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral examination, 15-30 minutes

Additional Information

Prerequisites

The start of the internship and participation in the practical seminar is permitted if at least 80 ECTS have been proven.

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.

6.2.13 Cost Accounting, Controlling & Financial Management

Name

Kosten- und Leistungsrechnung, Controlling & Finanzmanagement / Cost Accounting, Controlling & Financial Management

Code

5.1

Coordinator

Prof. Dr. Jana Görmer-Redding

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 6, CP credits: 8,

Contact hours: 90h, Independent study: 150h, Total workload: 240h

Courses

Cost Accounting, Controlling & Financial Management (6 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872110 (according to SPO no 5.1)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, auxiliary: non-programmable calculator, 1 DIN A4 sheet (front and back) with handwritten, personal lecture summary

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.

6.2.14 Applied Artificial Intelligence

Name

Angewandte Künstliche Intelligenz / Applied Artificial Intelligence

Code

6.1

Coordinator

Prof. Dr. Wolfgang Kratsch
Prof. Dr. Björn Häckel

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Applied Artificial Intelligence (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872120 (according to SPO
no 6.1)

Grading

According to § 20 of the APO in the currently valid
version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

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

6.2.15 Production and Logistics

Name

Produktion und Logistik / Production and Logistics

Code

6.2

Coordinator

Prof. Dr. Arne Mayer

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Production and Logistics (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872130 (according to SPO no 6.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, carried out as electronic examination
auxiliary: calculator

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
- Aspects of sustainability, resource management and environmental protection in production processes

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 Jammerneegg und Oskar Grün: Grundzüge der Beschaffung, Produktion und Logistik. 3., aktualisierte Auflage. München: Pearson Studium, 2013.

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

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

Tate, W.: Definitive Guide to Supply Management and Procurement: The: Principles and Strategies for Establishing Efficient, Effective, and Sustainable Supply Management Operations, 1st edition, Pearson FT Press, 2019

Hopp, Wallace J., Spearman, Mark L.: Factory Physics, 3rd edition, Waveland Press, 2011

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/>

6.2.16 Business Modelling

Name

Geschäftsmodellierung / Business Modelling

Code

6.3

Coordinator

Prof. Dr. Claudia Reuter

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Business Modelling (4 Credit hours)

Teaching and learning methods

Seminar format, practical work

Exam

Examination number

9872140 (according to SPO no 6.3)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, carried out as electronic examination
auxiliary: lecture notes, literature cited

Additional Information

Prerequisites

Introduction to Information Systems and Programming 1 of Semester 1 and 2 (recommended)

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

6.2.17 Seminar New Technologies

Name

Seminar New Technologies / Seminar New Technologies

Code

6.4

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,

Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Seminar New Technologies (2 Credit hours)

Teaching and learning methods

Seminar

Exam

Examination number

9872150 (according to SPO no 6.4)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 10-20 pages, 50%
- Oral examination, 20-40 minutes, 50%

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.

6.2.18 Compulsory Elective Subjects

Name

Fachbezogene Wahlpflichtmodule / **Compulsory Elective Subjects**

Code

PEE

Coordinator

Professors of the Faculty of Computer Science

Teaching language

See details of the respective required elective module.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or summer semester

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).

Courses

The required elective modules can be chosen from the offer of the Faculty of Computer Science.

Teaching and learning methods

Seminar, Seminar format, practical work

Exam

Grading

Examination number

(according to SPO no W.1)

According to § 20 of the APO in the currently valid version.

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.

Additional Information

Prerequisites

Information on participation in required elective modules can be found under §§ 3, 4, 5 of the study and examination regulations.

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.

6.2.19 General Science Elective Subjects

Name

General Science Elective Subjects / General Science Elective Subjects

Code

AWP

Coordinator

Professors of the Faculty of Liberal Arts and Sciences

Teaching language

The module is taught in German and English.

Faculty

Faculty of Liberal Arts and Sciences

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or summer semester

Total workload and its constituent parts

CP: 2,
Please look at the module catalogue of the Faculty of Liberal Arts and Sciences.

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.

Teaching and learning methods

The teaching and learning methods, as well as the teaching media used, vary depending on the course.

Exam

Examination number

(according to SPO no W.2)

Grading

According to § 20 of the APO in the currently valid version.

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.

Additional Information

Prerequisites

Information on participation in compulsory elective subjects can be found under §§ 6 and 7 of the study and examination regulations.

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.

6.2.20 Bachelor Thesis

Name

Bachelorarbeit / Bachelor Thesis

Code

BA

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter or/and summer semester

Total workload and its constituent parts

ECTS: 12, Working hours: 360 h

Processing time: 4 months

Courses

Teaching and learning methods

Bachelor Thesis

Exam

Examination number

(according to SPO no 7.1)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Bachelor Thesis, 20-80 pages

Additional Information

Prerequisites

Information on the Bachelor thesis can be found under § 12 of the study and examination regulations.

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.

6.2.21 Bachelor Seminar

Name

Bachelor Seminar / Bachelor Seminar

Code

Coordinator

Professors of the Faculty of Computer Science

Teaching language

The module is taught in English or in German.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

The duration of the module is one semester.
The module is regularly offered in both the summer and winter semesters.

Total workload and its constituent parts

Credit hours: 2, CP credits: 2,
Contact hours: 30h, Independent study: 30h, Total workload: 60h

Courses

Bachelor Seminar (2 Credit hours)

Teaching and learning methods

Seminar

Exam

Examination number

(according to SPO no 7.2)

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Oral examination, 30 minutes

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.

7 Additional Courses: Required Electives–Bachelor's Degree

7.1 Digital Transformation in Organizations

Name

Digitale Transformation in Organisationen / Digital Transformation in Organizations

Code

DTO4.WP

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Digital Transformation in Organizations (4 credit hours)

Teaching and learning methods

Seminar format, practical group work and case studies, industry talks

Exam

Examination number

IN 3970377, 2970875

TI 3976579, 2976686

WI 3975795

IIS 9775115

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 50%
- Written assignment, 10-15 pages, 50%

Additional Information

Prerequisites

Students should have acquired basic skills in informatics or business information systems to understand core concepts/fundamentals behind business organizations and digital technologies. Bachelor (5th semester) or master in business information systems or computer science is recommended.

Content of the module

Digitalization is one of the megatrends of our time. We live in a time where digital technologies and their applications make astonishing progress. Cars become driverless, computers beat humans in chess and Jeopardy and 3D-printers create houses. In the first part of this course the terms digitalization and digital transformation will be defined and the foundations are laid. Specifically, the following topics will be covered:

- Digital transformation – why it is one of the biggest buzzwords but also megatrends of our time
- Digitalization and digital transformation: Definition and delimitation
- A framework for organizations, individuals, and digital technology
- Historical evolution of industry and (digital) technologies
- Key digital technologies of our time
- Influence of digital technologies on organizations

Many organizations are confronting the question of how to design and manage the digital transformation. Based on phase-models of innovation adoption, the generic transformation process will be explained. Along this process, specific tasks and challenges that an organization needs to design and manage will be introduced. Specifically, the following topics will be covered:

- Stage models for digital transformation in organizations
- Key design aspects for digital transformations
- Methods and instruments to design, manage and facilitate digital transformations

Overall, this course is aimed at giving students the opportunity to learn and practice important aspects of digital transformations in organizations, one of the most pressing topics of our time for businesses around the globe. Group work with (research) papers and case studies will be used to complement the concepts and examples from the lecture. In industry talks, practitioners will share their own experiences from digital transformation management.

Qualification aims for the module learning objectives/skills

Students that aim at learning the design and management aspects of digitalization in organizations will create and deepen their knowledge. Students will be prepared for working in digital transformation projects in business organizations. After successful participation, students particularly will:

- Understand the term and the reasons for accelerated digital transformation in organizations
- Understand the technological and conceptual foundations of digital transformation
- Remember the historical evolution of industries and (digital) technologies
- Understand the influence of digital technologies on organizations
- Understand the typical phases and tasks in digital transformations
- Analyze and evaluate design and management problems in digital transformations
- Apply methods and instruments to create solutions for real world problems in the context of digital transformation projects

Reading list

Literature recommendations will be provided in the lecture

7.2 Human-Computer Interaction Research

Name

Human-Computer Interaction Research / Human-Computer Interaction Research

Code

HCIR4.WP

Coordinator

Prof. Dr. Michael Kipp

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

Required elective for bachelor's degree programs Computer Science and Computer Engineering

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Human-Computer Interaction Research (4 credit hours)

Teaching and learning methods

Lecture, practical course, colloquium, seminar-based teaching

Exam

Examination number

IN -, -

TI -, -

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Presentation, 15 minutes, 25%
- Project work, 50%
- Written assignment, 15-20 pages, 25%

Additional Information

Prerequisites

The requirements for this course are solid programming skills, prior experience with working scientifically, a good command of the English language (reading, writing and speaking) and an interest in working both analytically and creatively to develop novel interaction methods.

Content of the module

The course includes a series of lectures by the lecturer. Students will give oral presentations and work on assignments at home, both individually and in teams. Students will also work on a final team project which engages them in scientific thinking, practical implementation and critical reflection.

In the course students will learn about fundamental concepts of human-computer interaction and various research areas that try to improve traditional ways of human-computer interaction by including touch, gesture, facial and bodily actions to make the interaction more intuitive, natural and efficient.

Students will also get to know and apply methods to evaluate interactive systems objectively (measurable aspects) and subjectively (user feedback).

Qualification aims for the module learning objectives/skills

Knowledge

- Fundamentals of human-computer interaction
- Touch interaction
- Gestural interaction
- Tangible interaction
- Proxemic, spatial, full-body interaction
- Cross-device interaction

Skills

- Understanding and presenting a research publication
- Implementing a running prototype of an interactive system
- Applying evaluation methods for an interactive system
- Critically discussing research publications
- Working in a team

Competencies

- Understanding and further developing a research topic
- Informally evaluating a prototype

Reading list

B. Buxton, S. Greenberg, S. Carpendale, N. Marquardt (2012) Sketching User Experiences: The Workbook, Morgan Kaufmann, 262 pages.

B. Albert, T. Tullis (2013) Measuring the User Experience, 2. Edition, Morgan Kaufmann, 301 pages.

J. Butler, K. Holden, W. Lidwell (2010) Universal Principles of Design, Rockport Publishers, 272 pages.

7.3 IT Sourcing and Cloud Transformation

Name

IT Sourcing and Cloud Transformation / IT Sourcing and Cloud Transformation

Code

ITSCT4.WP

Coordinator

Prof. Dr. Arne Mayer

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

IT Sourcing and Cloud Transformation (4 credit hours)

Teaching and learning methods

Seminar-based instruction at the beginning - Supported by case studies, group discussions and guest lectures. In the further course, work in small groups, in which the students work out the practice-relevant content themselves.

Exam

Examination number

IN 3970380, 2970878

TI 3976596, 2976689

WI 3975798

IIS 9775133

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, auxiliary: non-programmable calculator

Content of the module

Offshoring and outsourcing as well as the change from classic IT models to the cloud are a 'must have' for organizations in high-wage countries like Germany. This stems not only from an economic point of view, but also against the background of the permanent shortage of IT specialists. As a result, complexity and demands on the IT of organizations increase significantly. In this module - with a strong focus on relevant, current problems - students are prepared for opportunities and challenges in their future professional life.

The following blocks are covered:

- Off- and nearshoring (regional IT sourcing)
- Outsourcing (external IT sourcing)
- Transformation to the Cloud / Everything as a Service
- Low code platforms as game changers in software development
- Robosourcing, AI, and Automation
- Sustainability aspects of cloud IT and economic valuation

Qualification aims for the module learning objectives/skills

After successfully completing the module, students will be able to

- develop specific solution approaches for current problems in the sourcing area
- understand cultural problems and find initial solutions
- understand the potential of the cloud and new technologies
- implement simple programs in cloud platforms

Reading list

Laudon, K. C.; Laudon, J. P.: Management Information Systems: Managing the Digital Firm, 17th edition, Pearson

Willcocks, L.P.; Lacity, M.C.; Sauer C.: Outsourcing and Offshoring Business Services 1st edition, Palgrave Macmillan

Hirschheim, R.; Heinzl, A.; Dibbern, J.: Information Systems Outsourcing, 5th Edition, Springer

Gore, A.: The Future, 1st edition, Random House

Ross, A.: The Industries of the Future, 1st edition, Simon & Schuster

7.4 Lean IT & Enterprise Architecture

Name

Lean IT & Enterprise Architecture / **Lean IT & Enterprise Architecture**

Code

LEANIT4.WP

Coordinator

Prof. Dr. Stephan Zimmermann

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Lean IT & Enterprise Architecture (4 credit hours)

Teaching and learning methods

Lecture and seminar lessons with laboratory exercises and case studies to apply the knowledge acquired. In addition, the exercises support self-study.

Exam

Examination number

IN 3970394, 2970892

TI 3976600, 2976714,

WI 3975812,

IIS 9775171

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 15-30 pages

Additional information on the type of examination

-

Additional Information

Prerequisites

The requirements for this course are a basic command of the English language, and an interest in better managing IT organizations and enterprise architectures.

Content of the module

IT in companies is becoming more and more important and complex. A numerous and increasing number of applications, systems and IT services used in business processes and delivered by IT organizations substantiates this development.

Lean IT and Enterprise Architecture Management (EAM) help companies to address related challenges. While Lean IT uses lean principles to develop and manage IT products and services with the central concern to eliminate waste in the context of IT that adds no value for the customer or user, EAM describes the management practice to transform the IT landscape by defining, communicating, and using a coherent set of strategies and guidelines.

In this course students will learn about the fundamental concepts of lean IT and enterprise architectures, and how these two topics connect. They also get to know techniques to develop strategies, analyze waste and work in value streams, and build business, information system and technology architectures.

Students will play several lean games to increase their lean mindset and solve several case studies regarding enterprise architecture challenges in practice. Supported by the novel “The Phoenix Project” they will have an additional touchpoint to practical challenges.

Knowledge focus:

- Lean IT concepts (value, waste, value streams, pull, flow)
 - Value stream mapping
 - The Four Types of Work
 - Kanban-Boards
- Enterprise Architecture concepts: Business, Information System and Technology Architecture
 - Business Capability Management
 - IT Portfolio Management
 - The Open Group Architecture Framework (TOGAF)
 - Visualization of IT landscapes

Qualification aims for the module learning objectives/skills

After successful participation in the module, the students can:

- illustrate waste, work, and Kanban in a lean IT context
- apply value stream mapping for IT services & products
- demonstrate competencies with the application of EA methods and IT landscape modelling
- apply business capability management and IT portfolio techniques
- illustrate enterprise architecture frameworks
- solving practical case studies and scenarios
- articulate course related ideas and concepts in English.

Reading list

Ahlemann, F., Stettiner, E., Messerschmidt, M., Legner, C. (2012): Strategic Enterprise Architecture Management Challenges, Best Practices, and Future Developments, Springer-Verlag Berlin Heidelberg.

Kim, Gene; Behr, Kevin; Spafford, George (2013) : The Phoenix Project – A novel about IT, DevOps and helping your business win, IT Revolution Press.

Lankhorst M. (2013) : Enterprise architecture at work: Modelling, communication, and analysis. Springer, Berlin.

Peppard J., Ward J. (2016) : The strategic management of information systems: Building a digital strategy. Wiley, Chichester, West Sussex.

The Open Group (2018), The Open Group Architectural Framework (TOGAF) Version 9.2. The Open Group, Reading, UK.

7.5 Network Engineering

Name

Network Engineering / Network Engineering

Code

NETENG4.WP

Coordinator

Prof. Dr. Rolf Winter

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Network Engineering (2 credit hours)

Network Engineering labs(2 credit hours)

Teaching and learning methods

Lecture and seminar lessons with laboratory exercises. In addition, the exercises support self-study.

Exam

Examination number

IN 3970424, -

TI 3976658, 2976748

WI 3975842

IIS -

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 60 minutes, none auxiliaries

Content of the module

- Fundamentals and concepts of computer networks
- The reference model of computer networks
- Basics of Huawei's VRP network operating system as an example of one such system
- Structure of IP networks
- Fundamentals of IP routing using OSPF as an example
- Structure of L2 networks including VLAN, STP, link aggregation and switch stacking
- Network security and network access
- Network services and applications
- Fundamentals of wireless LAN
- WAN technologies
- Network management
- Fundamentals of SDN and network automation
- Typical campus network architectures and practices

Qualification aims for the module learning objectives/skills

Students can explain how different network components and network protocols work, in particular on layers 2 and 3 of the ISO/OSI model. They can plan complex networks (both LAN and WAN) and can implement these networks practically based on these components, but they can also simulate them. They can configure network components of a given vendor, can diagnose faults and can write software to manage, operate and automate these network components. They understand modern networking concepts such as software defined networking and can apply fundamentals of these concepts.

Reading list

Data Communications and Network Technologies, Open Access Book, Springer 2023,
<https://link.springer.com/book/10.1007/978-981-19-3029-4>

James Kurose, Keith Ross: Computer Networking: A Top-Down Approach, 8th edition, Pearson 2021

7.6 Project Management

Name

Projektmanagement / Project Management

Code

PM4.WP

Coordinator

Prof. Dr. Markus Degen

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Project Management (4 Credit hours)

Teaching and learning methods

Seminar-style teaching with exercises in which individual areas of project management are simulated and worked on in small groups.

Exam

Examination number

BIS2019 8005129
MIN2017 8901690

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 7-12 pages

Content of the module

This module provides students with foundational and applied knowledge in both classical and agile project management methodologies. The focus is on the practical implementation of methods and tools necessary for initiating, planning, and managing (sub-)projects effectively in real-world settings.

Topics covered in the course include:

- Defining project goals, identifying stakeholders, and understanding the key responsibilities in project management
- Comparing and analysing of different roles in projects
- Classical and agile software development processes
- The Agile Manifesto and core agile principles
- Practical application and overview of agile concepts and tools (e.g., Scrum, MVP, User Stories, Planning Poker, Daily Stand-ups, etc.)
- Risk management strategies in project contexts
- Team leadership and collaboration within projects

Qualification aims for the module learning objectives/skills

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

- Take on different roles within agile project teams
- Justify decisions made in the roles of project team member or (sub-) project manager
- Compare various project management methodologies and techniques
- Identify project risks, assess their potential impact, and propose suitable mitigation strategies

Reading list

The reading materials and resources will be announced during the course.

8 Additional Courses: Required Electives–Master's Degree

8.1 Data Science

Name

Data Science / Data Science

Code

DASC4.WP

Coordinator

Prof. Dr.-Ing. Honorary Doctor of ONPU Thorsten Schöler

Teaching language

The module is taught in English, if necessary also in German

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,
Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Data Science (4 credit hours)

Teaching and learning methods

- Seminar format
- Scientific Seminar
- Studies
- Small projects

Exam

Examination number

BIS2019 8005026
MIN2017 8900650

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 8-20 pages

Additional Information

Prerequisites

- Good programming skills (Python, Java, etc.)
 - Interest in scientific challenges
 - Solid mathematical understanding
-

Content of the module

Introduction to Data Science:

Introduction, Data Science and the Internet of Things

Short introduction to Python

Extract Transform Load (ETL):

Setup, ETL and Hadoop, How Uber designed its big data platform, Accessing SQL databases, Airline delay data set, Unstructured/semi-structured data, Time series analysis of earth oscillation data, Further examples, Additional open data sources

Visualisation:

Introduction, Curve plotting, Using panels, Scatterplots, Histograms, Bar graphs, Image visualisation, Selected graphical examples with pandas, Advanced data learning representation, Feature importance, Further material

Statistics and classification:

Literature, Statistics, Linear regression, Correlation and covariance, Classification

Machine Learning:

Introduction, Unsupervised learning, Supervised learning, (Reinforcement learning)

Deep learning:

Introduction, Darknet, ConvNetJS MNIST demo, Lasagne MNIST, Another deep learning MNIST example in Lasagne and other toolkits, Introduction to TensorFlow, Introduction to Keras,

Datenkraken:

Examples, Workshop

Sensor data fusion:

Introduction, JDL data fusion model, Subsumption architecture, Literature

Qualification aims for the module learning objectives/skills

The participants understand the basic procedures and methods in the field of Big Data and Data Science. They can use various software libraries in the field of data science and machine learning. They are able to analyse, visualise and evaluate or classify large amounts of data. Within the framework of a small project, you will develop your own methods for data analysis in a self-imposed task.

Reading list

- Y. Hofstetter**, Sie wissen alles: Wie intelligente Maschinen in unser Leben eindringen und warum wir für unsere Freiheit kämpfen müssen. München: C. Bertelsmann Verlag, 2014.
- W. McKinney**, Datenanalyse mit Python: Auswertung von Daten mit Pandas, NumPy und IPython, 1. Auflage, O'Reilly, 2015.
- J. Grus**, Einführung in Data Science: Grundprinzipien der Datenanalyse mit Python, 1. Auflage, O'Reilly, 2016.
- R. Bruns und J. Dunkel**, Event-Driven Architecture: Softwarearchitektur für ereignis-gesteuerte Geschäftsprozesse, 1. Auflage, Berlin u.a.: Springer, 2010.

8.2 Digital Transformation in Organizations

Name

Digitale Transformation in Organisationen / Digital Transformation in Organizations

Code

DTO4.WP

Coordinator

Prof. Dr. Jens Lauterbach

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Digital Transformation in Organizations (4 credit hours)

Teaching and learning methods

Seminar format, practical group work and case studies, industry talks

Exam

Examination number

BIS2019 8005083

MIN2017 8901240

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Project work, 50%
- Written assignment, 10-15 pages, 25%
- Presentation, 15-25 minutes, 25%

Additional Information

Prerequisites

Students should have acquired basic skills in informatics or business information systems to understand core concepts/fundamentals behind business organizations and digital technologies. Bachelor (5th semester) or master in business information systems or computer science is recommended.

Content of the module

Digitalization is one of the megatrends of our time. We live in a time where digital technologies and their applications make astonishing progress. Cars become driverless, computers beat humans in chess and Jeopardy and 3D-printers create houses. In the first part of this course the terms digitalization and digital transformation will be defined and the foundations are laid. Specifically, the following topics will be covered:

- Digital transformation – why it is one of the biggest buzzwords but also megatrends of our time
- Digitalization and digital transformation: Definition and delimitation
- A framework for organizations, individuals, and digital technology
- Historical evolution of industry and (digital) technologies
- Key digital technologies of our time
- Influence of digital technologies on organizations

Many organizations are confronting the question of how to design and manage the digital transformation. Based on phase-models of innovation adoption, the generic transformation process will be explained. Along this process, specific tasks and challenges that an organization needs to design and manage will be introduced. Specifically, the following topics will be covered:

- Stage models for digital transformation in organizations
- Key design aspects for digital transformations
- Methods and instruments to design, manage and facilitate digital transformations

Overall, this course is aimed at giving students the opportunity to learn and practice important aspects of digital transformations in organizations, one of the most pressing topics of our time for businesses around the globe. Group work with (research) papers and case studies will be used to complement the concepts and examples from the lecture. In industry talks, practitioners will share their own experiences from digital transformation management.

Qualification aims for the module learning objectives/skills

Students that aim at learning the design and management aspects of digitalization in organizations will create and deepen their knowledge. Students will be prepared for working in digital transformation projects in business organizations. After successful participation, students particularly will:

- Understand the term and the reasons for accelerated digital transformation in organizations
- Understand the technological and conceptual foundations of digital transformation
- Remember the historical evolution of industries and (digital) technologies
- Understand the influence of digital technologies on organizations
- Understand the typical phases and tasks in digital transformations
- Analyze and evaluate design and management problems in digital transformations
- Apply methods and instruments to create solutions for real world problems in the context of digital transformation projects

Reading list

Literature recommendations will be provided in the lecture

8.3 Embedded Security

Name

Embedded Security / Embedded Security

Code

EMBSEC.WP

Coordinator

Prof. Dr.-Ing. Dominik Merli

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Embedded Security (4 credit hours)

Teaching and learning methods

Seminar-like lectures and supporting practical exercises

Exam

Examination number

BIS2019 8005037
MIN2017 8900740

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written examination, 90 minutes, auxiliary: calculator, English-Dictionary

Additional Information

Prerequisites

None

Content of the module

1. Introduction, Standards and Processes
 - Standards for Secure Components
 - Secure Development Process
2. Fundamental Embedded Security Building Blocks
 - Random Number Generators
 - Cryptographic Implementations
 - Secure Memory and Data Storage
 - Secure Device Identity
 - Secure Communication
3. Hardware and Firmware Level Security Measures
 - Secure Boot Process
 - Secure Firmware Update
 - Robust Device Architecture
4. Operating System Level Security Measures
 - Access Control and Management
 - System Monitoring

Qualification aims for the module learning objectives/skills

After successful participation, students are able to:

- derive security requirements for embedded systems and a secure development process
- explain fundamental embedded security building blocks
- name countermeasures for typical attacks on embedded systems
- describe advantages and disadvantages of different cryptographic implementations and protection measures
- explain device security concepts on hardware, firmware and operating system level and the reasoning behind them

Reading list

- D. Mukhopadhyay, R. S. Chakraborty:** "Hardware Security: Design, Threats, and Safeguards", Chapman and Hall/CRC, 2014
- S. Mangard, E. Oswald, T. Popp:** "Power Analysis Attacks: Revealing the Secrets of Smart Cards", Springer, 2007
- C. Paar, J. Pelzl:** "Understanding Cryptography: A Textbook for Students and Practitioners", Springer, 2010
- C. K. Koc (Ed.):** "Cryptographic Engineering", Springer, 2009

8.4 Human-Computer Interaction Research

Name

Human-Computer Interaction Research / Human-Computer Interaction Research

Code

HCIR4.WP

Coordinator

Prof. Dr. Michael Kipp

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Human-Computer Interaction Research (4 credit hours)

Teaching and learning methods

Lecture, practical course, colloquium, seminar-based teaching

Exam

Examination number

BIS2019 -
MIN2017 -

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Presentation, 15 minutes, 25%
- Project work, 50%
- Written assignment, 15-20 pages, 25%

Additional Information

Prerequisites

The requirements for this course are solid programming skills, prior experience with working scientifically, a good command of the English language (reading, writing and speaking) and an interest in working both analytically and creatively to develop novel interaction methods.

Content of the module

The course includes a series of lectures by the lecturer. Students will give oral presentations and work on assignments at home, both individually and in teams. Students will also work on a final team project which engages them in scientific thinking, practical implementation and critical reflection.

In the course students will learn about fundamental concepts of human-computer interaction and various research areas that try to improve traditional ways of human-computer interaction by including touch, gesture, facial and bodily actions to make the interaction more intuitive, natural and efficient.

Students will also get to know and apply methods to evaluate interactive systems objectively (measurable aspects) and subjectively (user feedback).

Qualification aims for the module learning objectives/skills

Knowledge

- Fundamentals of human-computer interaction
- Touch interaction
- Gestural interaction
- Tangible interaction
- Proxemic, spatial, full-body interaction
- Cross-device interaction

Skills

- Understanding and presenting a research publication
- Implementing a running prototype of an interactive system
- Applying evaluation methods for an interactive system
- Critically discussing research publications
- Working in a team

Competencies

- Finding and formulating a research topic
- Formally evaluating a prototype

Reading list

- B. Buxton, S. Greenberg, S. Carpendale, N. Marquardt (2012)** Sketching User Experiences: The Workbook, Morgan Kaufmann, 262 pages.
- B. Albert, T. Tullis (2013)** Measuring the User Experience, 2. Edition, Morgan Kaufmann, 301 pages.
- J. Butler, K. Holden, W. Lidwell (2010)** Universal Principles of Design, Rockport Publishers, 272 pages.

8.5 IT Sourcing and Cloud Transformation

Name

IT Sourcing and Cloud Transformation / IT Sourcing and Cloud Transformation

Code

ITSCT4.WP

Coordinator

Prof. Dr. Arne Mayer

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

IT Sourcing and Cloud Transformation (4 credit hours)

Teaching and learning methods

Seminar-based instruction at the beginning - Supported by case studies, group discussions and guest lectures. In the further course, work in small groups, in which the students work out the practice-relevant content themselves.

Exam

Examination number

BIS2019 8005086
MIN2017 8901270

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written examination, 60 minutes, auxiliary: non-programmable calculator, 70%
- Presentation, 15 minutes, plus 10 minutes Discussion, 30%

Content of the module

Offshoring and outsourcing as well as the change from classic IT models to the cloud are a 'must have' for organizations in high-wage countries like Germany. This stems not only from an economic point of view, but also against the background of the permanent shortage of IT specialists. As a result, complexity and demands on the IT of organizations increase significantly. In this module - with a strong focus on relevant, current problems - students are prepared for opportunities and challenges in their future professional life.

The following blocks are covered:

- Off- and nearshoring (regional IT sourcing)
- Outsourcing (external IT sourcing)
- Transformation to the Cloud / Everything as a Service
- Low code platforms as game changers in software development
- Robosourcing, AI, and Automation
- Sustainability aspects of cloud IT and economic valuation

Qualification aims for the module learning objectives/skills

With successful participation in the module, students can:

- develop specific solution approaches for current problems in the sourcing area
- understand cultural problems and find initial solutions
- understand the potential of the cloud and new technologies
- implement simple programs in cloud platforms
- Master students, in addition, will be able to elaborate a topic in the area of IT Sourcing & Cloud Transformation freely and gain presentation skills

Reading list

Laudon, K. C.; Laudon, J. P.: Management Information Systems: Managing the Digital Firm, 17th edition, Pearson

Willcocks, L.P.; Lacity, M.C.; Sauer C.: Outsourcing and Offshoring Business Services
1st edition, Palgrave Macmillan

Hirschheim, R.; Heinzl, A.; Dibbern, J.: Information Systems Outsourcing, 5th Edition,
Springer

Gore, A.: The Future, 1st edition, Random House

Ross, A.: The Industries of the Future, 1st edition, Simon & Schuster

8.6 Lean IT & Enterprise Architecture

Name

Lean IT & Enterprise Architecture / **Lean IT & Enterprise Architecture**

Code

LEANIT4.WP

Coordinator

Prof. Dr. Stephan Zimmermann

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Lean IT & Enterprise Architecture (4 credit hours)

Teaching and learning methods

Lecture and seminar lessons with laboratory exercises and case studies to apply the knowledge acquired. In addition, the exercises support self-study.

Exam

Examination number

BIS2019 8005096
MIN2017 8901370

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Portfolio exam:

- Written assignment, 15-30 pages, 60%
 - Oral examination, 20-30 minutes, 40%
-

Additional information on the type of examination

The oral examination is the design of a lecture unit as a group task.

Additional Information

Prerequisites

The requirements for this course are a basic command of the English language, and an interest in better managing IT organizations and enterprise architectures.

Content of the module

IT in companies is becoming more and more important and complex. A numerous and increasing number of applications, systems and IT services used in business processes and delivered by IT organizations substantiates this development.

Lean IT and Enterprise Architecture Management (EAM) help companies to address related challenges. While Lean IT uses lean principles to develop and manage IT products and services with the central concern to eliminate waste in the context of IT that adds no value for the customer or user, EAM describes the management practice to transform the IT landscape by defining, communicating, and using a coherent set of strategies and guidelines.

In this course students will learn about the fundamental concepts of lean IT and enterprise architectures, and how these two topics connect. They also get to know techniques to develop strategies, analyze waste and work in value streams, and build business, information system and technology architectures.

Students will play several lean games to increase their lean mindset and solve several case studies regarding enterprise architecture challenges in practice. Supported by the novel “The Phoenix Project” they will have an additional touchpoint to practical challenges.

Knowledge focus:

- Lean IT concepts (value, waste, value streams, pull, flow)
 - Value stream mapping
 - The Four Types of Work
 - Kanban-Boards
 - Evaluating Lean IT concepts in an organizational context
- Enterprise Architecture concepts: Business, Information System and Technology Architecture
 - Business Capability Management
 - IT Portfolio Management
 - The Open Group Architecture Framework (TOGAF)
 - Visualization of IT landscapes
 - Evaluating IT Portfolios, Strategies & Capabilities
 - Strategic Dialogs

Qualification aims for the module learning objectives/skills

After successful participation in the module, the students can:

- illustrate waste, work, and Kanban in a lean IT context
- apply value stream mapping for IT services & products
- evaluate IT concepts in organizational structures
- demonstrate competencies with the application of EA methods and IT landscape modelling
- apply business capability management and IT portfolio techniques
- apply enterprise architecture frameworks
- solving practical case studies and scenarios
- articulate course related ideas and concepts in English
- connect Lean IT concepts and Enterprise Architecture.

Reading list

Ahlemann, F., Stettiner, E., Messerschmidt, M., Legner, C. (2012): Strategic Enterprise Architecture Management Challenges, Best Practices, and Future Developments, Springer-Verlag Berlin Heidelberg.

Kim, Gene; Behr, Kevin; Spafford, George (2013) : The Phoenix Project – A novel about IT, DevOps and helping your business win, IT Revolution Press.

Lankhorst M. (2013) : Enterprise architecture at work: Modelling, communication, and analysis. Springer, Berlin.

Peppard J., Ward J. (2016) : The strategic management of information systems: Building a digital strategy. Wiley, Chichester, West Sussex.

The Open Group (2018), The Open Group Architectural Framework (TOGAF) Version 9.2. The Open Group, Reading, UK.

8.7 Project Management

Name

Projektmanagement / Project Management

Code

PM4.WP

Coordinator

Prof. Dr. Markus Degen

Teaching language

English

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, winter semester

Total workload and its constituent parts

Credit hours: 4, CP credits: 5,

Contact hours: 60h, Independent study: 90h, Total workload: 150h

Courses

Project Management (4 Credit hours)

Teaching and learning methods

Seminar-style teaching with exercises in which individual areas of project management are simulated and worked on in small groups.

Exam

Examination number

BIS2019 8005129
MIN2017 8901690

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written assignment, 12-15 pages

Content of the module

This module provides students with foundational and applied knowledge in both classical and agile project management methodologies. The focus is on the practical implementation of methods and tools necessary for initiating, planning, and managing (sub-) projects effectively in real-world settings, as well as theoretical foundations of project management methods.

Topics covered in the course include:

- Defining project goals, identifying stakeholders, and understanding the key responsibilities in project management
- Classical and agile software development processes
- The Agile Manifesto and core agile principles
- Practical application of agile concepts and tools (e.g., MVP, Backlog, User Stories, Planning Poker, Daily Stand-ups, etc.)
- Overview and comparison of agile frameworks such as Kanban, Scrum, and Extreme Programming
- Scaled agile methods for managing large-scale projects
- Risk management strategies in project contexts
- Team leadership and collaboration within projects

Qualification aims for the module learning objectives/skills

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

- Take on different roles within agile project teams
- Justify decisions made in the roles of project team member or project manager
- Compare and critically evaluate various project management methodologies and techniques
- Identify project risks, assess their potential impact, and propose suitable mitigation strategies

Reading list

The reading materials and resources will be announced during the course.

8.8 Smart Sustainability Simulation Game (S3G)

Name

Smart Sustainability Simulation Game (S3G) / Smart Sustainability Simulation Game (S3G)

Code

S3G2.WP

Coordinator

Prof. Dr. Björn Häckel

Teaching language

The module is taught in English.

Faculty

Faculty of Computer Science

Usage possibilities

see corresponding study program

Duration / Frequency

1 semester, summer semester

Total workload and its constituent parts

Credit hours: 2, CP credits: 5,
Contact hours: 30h, Independent study: 120h, Total workload: 150h

Courses

Smart Sustainability Simulation Game (S3G) (2 credit hours)

Teaching and learning methods

Project work

Exam

Examination number

BIS2019 8005099
MIN2017 8901400

Grading

According to § 20 of the APO in the currently valid version.

Type of exam / required course achievements

Written and computerbased Portfolio exam:

- Written assignment, 5-20 pages, 20%
- 4 case studies: Prepared analysis results and software code, je 20%

Additional Information

Prerequisites

Knowledge of statistics is required. Knowledge of Python or another programming language as well as knowledge of Data Science/Machine Learning, is an advantage.

Content of the module

- Work in a cross-university team in competition with other teams.
- Work on case studies along selected steps of a circular economy.
- Independent technical implementation of machine learning applications to solve business problems.
- Consideration and analysis of the technical, economic, environmental, and social implications of your work.

Qualification aims for the module learning objectives/skills

- Know and understand how to use and evaluate different machine learning approaches to solve business decision problems.
- Apply techno-economic skills.
- Structure business decision situations and analyze available data.
- Evaluate data using machine learning to make informed business decisions in the context of sustainability.
- Technically implement machine learning applications and evaluate (potential) economic, environmental, and social impacts.
- Practice team and project management skills and presentation techniques.

Reading list

Will be provided in the lecture.

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