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Akzentsetzungsmodule der Informatik

inf006 - Software Engineering II

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<tr>
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<tr>
<td>Workload</td>
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**Applicability of the module**

- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Praktische Informatik und Angewandte Informatik
- Bachelor's Programme Computing Science (Bachelor) > Akzentsetzungsbereich - Wahlbereich Informatik
- Master's Programme Business Informatics (Master) > Akzentsetzungs module der Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule

**Responsible persons**

- Winter, Andreas (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

- Softwaretechnik I

**Skills to be acquired in this module**

The objective of the module inf006 Software Engineering II is to deepen the subjects and skills of the module Software Engineering I. Special software engineering topics will be presented, deepened and discussed. The lecture deals with different software engineering methods and technology which will be discussed in the seminar. The discussions are contextualised by scientific research projects, practical projects and latest research findings.

**Professional competence**

The students:

- deepen software engineering methods and techniques
- use specific software engineering methods and techniques
- differentiate developmental techniques of software systems
- discuss software engineering topics
- design software systems by using appropriate methods
- solve software engineering problems independently
- reflect self-designed software engineering solutions critically and present them appropriately

**Methodological competence**

The Students:

- structure problems with modelling techniques
- develop actual methods of software engineering
- present software engineering solutions
- write scientific papers independently

**Social competence**

The Students:

- explain and discuss software development solutions in their practical use
- accept criticism and see it as an asset

**Self-competence**

The Students:

- reflect their problem-solving behaviour with regard to the possibilities of software technology
- internalize the presented developmental methods and integrate them in their own actions

**Module contents**

The following subjects are provided:
- Concept of systems
- Iterative and agile process models of software development
- System development and cost estimation
- Methods, techniques and tools to collect requirements
- Techniques to develop and describe software architecture
- Measurement and evaluation of software systems
- Extended techniques of modelling, meta-modelling, domain specific languages - Model based development
- Methods and techniques of software evolution

Recommended reading

- Helmut Balzert: Lehrbuch der Software-Technik, Spektrum Akademischer Verlag, 3. Auflage 2009
- and actual papers from IEEE Software, IEEE Transactions on Software-Engineering, Informatik-Spektrum and conferences (z.B. ICSE, ICSM, WCRE, CSMR, ICPC, SLE, u.a.)

Links

Language of instruction: German
Duration (semesters): 1 Semester
Module frequency: every summer term
Module capacity: unlimited

Type of module

Teaching/Learning method: 1VL + 1S
Previous knowledge: Software engineering I

Examination

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<td>Portfolio (30-minute presentation, 1 paper (4 pages, IEEE) and oral exam)</td>
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Type of course

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<td>Seminar</td>
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Total module attendance time: 56 h
inf008 - Information Systems II

Module label: Information Systems II
Module abbreviation: inf008
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Bachelor's Programme Business Informatics (Bachelor) > Aufbaucurriculum-Wahlbereich Praktische Informatik
- Bachelor's Programme Computing Science (Bachelor) > Akzentsetzungsbereich - Wahlbereich Informatik
- Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Wirtschaftsinformatik
- Master Applied Economics and Data Science (Master) > Specialization
- Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Wahlpflichtmodule (Praktische Informatik)
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik

Responsible persons:
- Grawunder, Marco (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirement

Skills to be acquired in this module:

Professional competence:
The students:
- know further concepts, languages and architectures of databases
- analyse advanced information processing tasks
- analyse complex requirements of information systems appropriately
- realize information requirements and gather relevant information

Methodological competence:
The students:
- propose concrete processing principles for special application classes
- reflect specific technologies' consequences and proceedings

Social competence:
The students:
- improve their ability to work in a team

Self-competence:
The students:
- reflect their problem-solving behaviour with regard to extended information processing concepts

Module contents:
- Implementation of databases (architecture, index structures, query processing and optimization)
- Data integration and data analysis (data integration, data warehouses, data mining)
- Information retrieval
- Parallel databases

Recommended reading:
Suggested reading:
- Härder, T., Rahm, E.: Datenbanksysteme - Konzepte und Techniken der Implementierung, Morgan Kaufmann
- U. Leser, F. Naumann. Informationsintegration: Architekturen und Methoden zur Integration verteilter und heterogener Datenquellen. dpunkt
- Bauer/Günzel. Data-Warehouse-Systeme, dpunkt
- Han/Kamber/Pei. Data Mining: Concepts and Techniques, Morgan Kaufmann
<table>
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<tr>
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<tr>
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**inf018 - Media Processing**

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**Applicability of the module**

- Bachelor's Programme Biology (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Business Administration and Law (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Praktische Informatik und Angewandte Informatik
- Bachelor's Programme Business Informatics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Chemistry (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer" more...
- Bachelor's Programme Comparative and European Law (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Computing Science (Bachelor) > Akzentsetzungsbereich - Wahlbereich Informatik
- Bachelor's Programme Computing Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Economics and Business Administration (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Engineering Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Environmental Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Intercultural Education and Counselling (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Mathematics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Physics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Physics, Engineering and Medicine (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Social Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Bachelor's Programme Sustainability Economics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Art and Media (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Biology (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Chemistry (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Computing Science (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Computing Science (Bachelor) > Praktische Vertiefung (60 KP)
- Dual-Subject Bachelor's Programme Dutch Linguistics and Literary Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Economic Education (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme Elementary Mathematics (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
- Dual-Subject Bachelor's Programme English Studies (Bachelor) > PP "Medieninformatik für Studierende musisch-künstlerischer Fächer"
Responsible persons

- Theel, Oliver (module responsibility)
- Boll-Westermann, Susanne (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites

- Solid programming skills in Java and/or C++, practical informatics. Interest in media processing

Skills to be acquired in this module

The students can explain the basics of image processing and know which algorithms exist for the basic tasks in image processing and how these are applied.

The students can apply basic methods of image processing they learned in the lecture to solve simple problems.

Professional competence:
The students

- can name basic characteristics of digital media
- can explain the most common methods for encoding and compressing images, video and audio
- can describe basic procedures for image enhancement, feature extraction, feature description, image analysis and image comprehension

Methodological competence:
The students

- can recognize and evaluate image properties and decide for suitable image processing methods
- can select existing software packages for simple image processing problems, as well as use and customize them for their specific task
- can implement simple image and media processing functions in a
higher programming language (e.g., C++)

Social competence
The students:

- can plan, implement, and document a software project in team work
- can present the results of their work to an audience and adequately respond to criticism and questions

Self competence
The students:

- can accept and learn from mistakes made during the process of implementation

Module contents
The lecture covers the technologies of media processing. In particular, the lecture focuses on image processing chain from digital imaging, through image pre-/and postprocessing, and image storage to image analysis. In addition to compression techniques and color space theory (RGB, HSV, YUV, CIEXYZ, ...), the topics of the lecture include image enhancement, feature extraction, feature description, image analysis and image comprehension. The lecture furthermore discusses the encoding and analysis of video and audio.

Recommended reading
- Literatur im Handapparat der Abteilung in der Bibliothek.
- Linkliste im Lernmanagementsystem zu den einzelnen Themen der Vorlesung.

Links
https://uol.de/en/media-informatics/teaching/courses

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
every winter term

Module capacity
12

Reference text

Type of module

Teaching/Learning method
1VL + 1Ü

Previous knowledge
Solid programming skills in Java and/or C++, practical informatics. Interest in media processing

Examination
The presentation of the practical project on a project day of all small groups takes place directly after the lecture period. The oral examination takes place in the first two weeks after the end of the lecture period. Any post-examinations will take place at the end of the lecture period. The exact schedule can be found on the department’s web pages as well as the information in the learning management system Stud.IP.

Type of examination
Project and oral Exam or project and written exam

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<th>Type of course</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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inf100 - Human Computer Interaction

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<td>Credit points</td>
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<td>Workload</td>
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<td>Master's Programme Engineering of Socio-Technical Systems (Master) &gt; Embedded Brain Computer Interaction</td>
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<tr>
<td>Responsible persons</td>
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<td>Boll-Westermann, Susanne (module responsibility)</td>
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<td>Prerequisites</td>
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<tr>
<td>Useful previous knowledge: Interactive Systems</td>
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<tr>
<td>Skills to be acquired in this module</td>
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<tr>
<td>With the help of suitable resources, the students can design, prototype, and evaluate a human-machine interface following the user-centered design process (HCD).</td>
<td></td>
</tr>
</tbody>
</table>

**Professional competence**

The students:

- can describe and explain the HCD process.
- can classify an unknown method into the HCD process when they are presented with a brief description.
- can select a suitable prototyping approach for a given application.
- can select a suitable prototyping method for a given application.
- can apply selected prototyping methods to create an interactive system.
- can name basic characteristics of human perception and motor skills and explain their importance for the development of interactive systems.
- can suggest and motivate improvement for a given user interface based on the gestalt laws.
- can explain the characteristics of human visual search and utilize it to improve given interfaces.
- can critically compare several variants of an interactive system’s concept based on the "Multiple Resource Theory".

**Methoden competence**

The students:

- can critically compare and select methods for context of use and/or user requirements analysis.
- can apply methods for context of use and/or user requirements analysis to a real-world example.
- can retrospectively discuss and evaluate the use of a method for context of use and/or user requirements analysis.
- can plan, moderate and evaluate an ideation session.
- can formulate a precise research question based on a given problem description.
- can discuss the advantages and disadvantages of an experiment design.
- can select a suitable experiment design for a given research question.
- can define hypotheses and null hypotheses for a given experiment.

**Social competence**

The students:

- can work out solutions for a given design problem in group work.
- can present solutions to design problem in the plenum.
- can motivate their methodical approach to a design problem.
- can discuss their designs and results in an appropriate and professional manner with the plenum.
- can accept criticisms by their peer group as valuable contributions to their designs.

**Self-competence:**

The students:

- can accept and learn from mistakes made during the design process.
The module covers research methods in the field of human-computer interaction. It discusses the core principles of human-computer interaction and the human-centered design process and its phases, context of use, requirements, and task analysis, prototyping and evaluation. Research methods used in the different phases of the process are introduced and discussed.

Available design options for human-machine interfaces are presented and discussed with regard to human perception capabilities and their limitations. The module discusses methods for user research, including surveys, diaries, case studies, interviews, and focus groups, as well as physiological measurements.

The module goes into further detail on evaluation methods, and introduces the foundations of experimental research in human-computer interaction, including types of research, research hypotheses, experimental design, and statistical analysis.

During the practical project, a concrete human-computer interface will be designed, developed and evaluated.

### Recommended reading

- Literature in the reserve shelf in the university bibliography.
- Link list in Stud.IP.

### Links

- [https://uol.de/en/media-informatics/teaching/courses](https://uol.de/en/media-informatics/teaching/courses)

### Languages of instruction

German, English

### Duration (semesters)

1 Semester

### Module frequency

every summer term

### Module capacity

unlimited

### Module level

Type of module: Teaching/Learning method

1VL + 1Ü

### Previous knowledge

Useful previous knowledge: Interactive Systems

### Examination

<table>
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<th>Type of examination</th>
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</thead>
<tbody>
<tr>
<td>Portfolio</td>
<td>Final exam of module</td>
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</table>

- The completed practical projects will be presented on a single project day, which will take place at the end of the lecture period. The oral exam takes place within the last two weeks of the lecture period. If necessary, re-examinations will take place at the end of the term. Details on the schedule can be found on the websites of the department and in Stud.IP.

### Type of course

<table>
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<th>Type of course</th>
<th>Comment</th>
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<th>Workload of compulsory attendance</th>
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### Total module attendance time

56 h
inf108 - Requirements Engineering and Management

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<td>Workload</td>
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| Applicability of the module | • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
• Master's Programme Computing Science (Master) > Praktische Informatik |
| Responsible persons | • Winter, Andreas (module responsibility)
• Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites | Kenntnisse aus Softwaretechnik I und Softwaretechnik II |

Skills to be acquired in this module

The objective of the module "Requirements Engineering and Management" is to convey the core concepts and technology of the requirements engineering and of the requirements management. In the second half of the semester these methods and techniques will be carried out practically to develop an exemplary requirements definition.

Professional competence

The students:

• integrate the process of requirements engineering in the software engineering process
• name the methods and tools of requirements engineering and management
• select methods and tools from requirements engineering and management to solve given problems appropriately
• illustrate the key tasks of the requirements engineering and management
• name the essential concepts to develop and to structure ideas
• discuss the methods of determination requirements and develop validation concepts
• differentiate the software development core activities in greater detail

Methodological competence

The students:

• apply the methods of determination, documentation, validation and confirmation of requirements and
• create a comprehensive requirement document in group work

Social competence

The students:

• communicate with all stakeholders dealing with software development
• design project visions in groups
• collect requirements in interviews
• design requirements for software systems collaboratively

Self-competence

The students:

• reflect their problem-solving behaviour by applying requirements engineering and management capabilities

Module contents

The module deals with requirements analysis core concepts as well as methods and techniques of requirements engineering and management. Topics of this module are:

• the necessity of requirements engineering and management
• the requirements engineering process in the software development process
• requirements engineering process (participants, documents, activities)
• understanding the application domains (vision development, system environment documentation, domain model development, use case identification)
• requirements collection (functional and non-functional requirements, requirements collection, requirements documentation, requirements validation, requirements needs)
• requirements management
### Recommended reading


### Links

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<tr>
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<th>German</th>
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<tbody>
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**Total module attendance time**: 56 h
inf109 - Information Systems III

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**Applicability of the module**
- Master Applied Economics and Data Science (Master) > Specialization
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik

**Responsible persons**
- Grawunder, Marco (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
- Information Systems I
- Information Systems II
- JAVA

**Skills to be acquired in this module**

### Professional competence
The students:
- describe concepts, languages and architectures of database systems
- discuss state-of-the-art database research topics
- analyse information processing tasks and implement solutions appropriately

### Methodological competence
The students:
- propose concrete processing requirements for special application classes
- assess the consequences of techniques and approaches
- perform supervised research in the field of information systems
- analyse and reflect complex information system requirements
- realize information demands and accordingly gather aim-oriented information

### Social Competencies
The students:
- solve problems partially in small groups
- present solution proposals in front of the exercise group
- discuss their different solution proposals within the exercise group

### Self-competences
The students:
- accept constructive criticism
- reflect on their proposed solution considering the taught methods

**Module contents**
This module is a continuation of the content of information systems I and of information systems II. It deepens and extends the contents of the preceding modules and focuses mainly on current research questions. A special focus lies on concept of distributed data management.

**Recommended reading**
- Özsu, M. Tamer; Valduriez, Patrick, Principles of distributed database systems
- Rahm/Saake/Sattler: Verteiltes und Paralleles Datenmanagement, Springer
- Paper from SIGMOD, VLDB or ICDE

**Links**

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inf111 - Advanced Database Practical

Module label | Advanced Database Practical
---|---
Module abbreviation | inf111
Credit points | 6.0 KP
Workload | 180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik

Responsible persons
- Grawunder, Marco (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- Operating system knowledge, Information system knowledge

Skills to be acquired in this module
Objective of the module/skills:
The module enhances the previous knowledge of databases and information systems. In the context of a professional database system the students realize, implement, install and optimize the system. Theoretical and mathematical approaches are additional contents. Additionally the course provides the capability both to describe the differences between NoSQL Databases and (Object-)Relational Databases and how to use them.

Professional competence
The students:
- name realisation techniques, implementations und programming of database systems
- program and implement database oriented system routines
- administer a professional database system - identify database system performance problems and solve them appropriately

Methodological competence
The students:
- make optimisation decisions during the modelling phase
- construct optimisation strategies mathematically

Social competence
The students:
- develop appropriate implementations for given problems in a team

Self-competence
The students:
- acknowledge the limits of their ability to cope with pressure during the implementation of database specific solutions

Module contents
Content of the Module:
The module is a practical course. It is a continuation of the modules Information Systems I and Information Systems II. This module especially deals with the technical and theoretical concepts of database systems. Practical database implementation approaches and optimisation concepts are additional content of the module. In detail the module provides: low-level database management programming, aspects of catalogue systems implementation, optimisation strategies based on different parallelisation and partitioning strategies, query concepts and modification.

Recommended reading
Suggested reading:
- Held Andrea (2007), Oracle 10g Addison-Wesley.
- Oracle 10g, Das Programmierhandbuch, Galileo Computing
- Oracle Database 11g, DBA-Handbuch, Oracle Press-Hanser Verlag
- NoSQL (2011) Hanser Verlag

Links
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inf112 - Modern Programming Technologies

Module label: Modern Programming Technologies
Module abbreviation: inf112
Credit points: 6.0 KP
Workload: 180 h

As part of the exercises, the students incrementally develop a complex software application in teams of 2 or 3 students. For this purpose, new subtasks with reference to the respective lecture content have to be worked on weekly. In the oral examination, the students have to show that they know the taught programming technologies and can use them appropriate when developing their own applications.

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik

Responsible persons
- Boles, Dietrich (Module counselling)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- good programming skills

Skills to be acquired in this module
The objective of the module is to provide the students with modern programming technologies. After the course, the students are able to use these technologies during the development and implementation of complex applications.

Professional competence
The students:
- name modern programming technologies
- appropriate use modern programming technologies to solve complex problems

Methodological competence
The students:
- search for solutions to specific problems in the internet independently

Social competence
The students:
- develop software in teams
- discuss own and someone else's solutions

Self-competence
The students:
- reflect their problem-solving behaviour and take up new solutions, e.g. from the internet

Module contents
The module enhances the students' programming skills. It focuses on modern programming technologies. Among others, these are .NET-Framework, Java Server Technologies like Java EE or Spring, Android App development or the development of skills for digital voice assistants. The new technologies are presented in the lecture part. In the exercises, the students develop their own larger applications in groups of 2 or 3 students in reference to the lecture content.

Recommended reading
list of links in the learning management system

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
every winter term

Module capacity
12

Reference text

Module level

Module code
inf112
**Type of module**

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**Previous knowledge**

good programming skills

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<td>The presentation of developed solutions takes place weekly during the exercises. Final delivery of the final software application is one week after the end of the lecture period. The oral exam take place in the second or third week after the end of the lecture period. Any re-examinations take place at the end of the semester break. The exact timetable can be found in the learning management system.</td>
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**Type of course**

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**Total module attendance time**

56 h
### inf113 - Operating Systems II

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<td>• Master's Programme Computing Science (Master) &gt; Praktische Informatik</td>
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<tr>
<td>Responsible persons</td>
<td>• Theel, Oliver (module responsibility)</td>
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<td>• Lehrenden, Die im Modul (authorised to take exams)</td>
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<td>Betriebssysteme I</td>
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<td>The aim of the module &quot;Operating Systems 2&quot; is to convey further knowledge and skills regarding the conception, implementation, and evaluation of operating systems.</td>
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<td><strong>Professional competence:</strong></td>
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<tr>
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<td>The Students:</td>
</tr>
<tr>
<td></td>
<td>• assess in detail what an operating system is able do</td>
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<td></td>
<td>• recognize the problems in the implementation of operating systems</td>
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<tr>
<td></td>
<td>• identify and evaluate implementations of further subproblems and apply them</td>
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<td><strong>Methodological competence:</strong></td>
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<td>The Students:</td>
</tr>
<tr>
<td></td>
<td>• transfer implementation concepts to other contexts</td>
</tr>
<tr>
<td></td>
<td>• critically question different solutions with regard to their properties</td>
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<td><strong>Social competence:</strong></td>
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<td>The Students:</td>
</tr>
<tr>
<td></td>
<td>• solve problems partly in small groups</td>
</tr>
<tr>
<td></td>
<td>• present own potential solutions to the exercise group</td>
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<td>• discuss their different potential solutions within the exercise group</td>
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<td><strong>Self-competence:</strong></td>
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<td>The Students:</td>
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<tr>
<td></td>
<td>• accept criticism</td>
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<td>• reflect their own potential solutions taking into account the methods taught</td>
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<td>2. Input/output control</td>
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<td>3. User representation</td>
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<td>4. Advanced synchronization concepts</td>
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<td>5. User interfaces</td>
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<td>6. Job scheduling</td>
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<td>7. Architectures of operating systems</td>
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<tr>
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<td>8. Examples of operating systems</td>
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<tr>
<td>Recommended reading</td>
<td>• A. Tanenbaum. Modern Operating Systems. Prentice Hall, Most recent edition</td>
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<td></td>
<td>• J.Nehmer (2001) Systemsoftware</td>
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<td></td>
<td>• Grundlagen moderner Betriebssysteme, dpunkt-verlag</td>
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**inf131 - Advanced Topics in Human Computer Interaction**

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction

**Responsible persons**
- Boll-Westermann, Susanne (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
- Useful previus knowledge: Interactive Systems

**Skills to be acquired in this module**

This course aims to provide a sample of some of the most recent and significant advances in this exciting area. Topics may include: situational awareness, designing for attention, ambient/peripheral interaction, computer support cooperative work and social computing (CSCW), ubiquitous and context-aware computing, haptic and gestural interaction, audio interaction, gaze-based interaction, biometric interfaces, and embedded, physical and tangible computing, mobile and wearable interfaces.

This course is explicitly not focused on the methods used in HCI practice (i.e., user-centered design cycle), but rather focuses on (recent) research.

**Professional competences**
The students:
- demonstrate a systematic understanding of knowledge and critical awareness of a selection of the recent research advances in the area of HCI
- evaluate and critique recent developments in the field of HCI on scientific and technological grounds
- develop ability to conceptualize, design, implement, and evaluate user-centered systems and techniques.
- plan an implement exploratory projects directed at envisioning and prototyping novel interactive artifacts

**Methodological competences**
The students:
- analyze, review and critique research papers
- carry out original research from start to finish
- summarize and present research findings
- work in a team to produce and evaluate prototypes of novel interactive artifact

**Social competences**
The students:
- work collaboratively in groups to analyze and review research papers
- summarize and present research findings to rest of class
- discuss how HCI concepts and methods can be applied in analysis, design, and evaluation of interactive technologies.
- discuss social and ethical implications of interactive technologies

**Self-competences**
The students:
- are comfortable tackling original research questions
- show aptitude in conceptualizing and running both qualitative and quantitative HCI experiments
- acquire the ability to summarize, analyze, and critique published (peer-review) research papers
HCI is a fast-growing field, where scientific research in this area crosses multiple disciplines. The body of theoretical and empirical knowledge that can inform the design of effective systems is rapidly developing, which underscores the importance of current research in the field. This course aims to provide a sample of some of the most recent and significant advances in this exciting area. Topics may include: situational awareness, designing for attention, ambient/peripheral interaction, computer support cooperative work and social computing (CSCW), ubiquitous and context-aware computing, haptic and gestural interaction, audio interaction, gaze-based interaction, biometric interfaces, and embedded, physical and tangible computing, mobile and wearable interfaces.

The course will consist of lectures and lab sessions. Lab sessions will cover assignments (writing paper reviews, presentations, and peer assessment). In addition to assignments and a final exam, a small part of the course includes a mini group-based HCI project.

Recommended reading


Links

https://uol.de/en/media-informatics/teaching/courses

Language of instruction

English

Duration (semesters)

1 Semester

Module frequency

every winter term

Module capacity

24

Reference text

Module level

Type of module

Teaching/Learning method

1VL + 1Ü

Previous knowledge

Useful previous knowledge: Interactive Systems

Examination

Examination times

Type of examination

Final exam of module

At the end of the lecture period

Project and oral exam

Missing the exam If you cannot attend the exam with valid reasons (medical reason, exam schedule conflicts), you need to inform us before the exam, and submit a scanned copy of the evidence (medical certificate, course registration, boarding passes) within 5 days after the exam.

- If the reason for missing the exam is valid, you will do your first try of the exam for the parts that you missed on the same date as the second chance exam.
- If the reason is not valid, you will not get any score from that exam. If your overall score passed the course, you will not have a chance to take the exam again.
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inf340 - Uncertainty Modeling for Control in Digitalised Energy Systems

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Applicability of the module

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Technische Informatik
- Master's programme Digitalised Energy Systems (Master) > Digitalised Energy System Design and Assessment
- Master's Programme Engineering of Socio-technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Rauh, Andreas (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- Basic knowledge of the control of linear time-continuous and/or time-discrete systems and/or robust control

Skills to be acquired in this module
- The students identify fundamentals of uncertainty modelling in control systems as well as problem-specific methods for the consideration of uncertainty during simulation and observer synthesis.

Professional competences

The students:
- identify fundamentals of uncertainty modeling in control systems
- characterize problem-specific solution techniques for systems with stochastic and set-based uncertainty
- are aware of software implementations in simulation, control, and state estimation.

Methodological competences

The students:
- students identify fundamentals of uncertainty modelling in control systems
- characterise problem-specific solution techniques for systems with stochastic and set-based uncertainty
- are aware of software implementations in simulation, control, and state estimation.

Social competences

The students:
- analyse problems of control-oriented uncertainty modelling
- analyse fundamental solution techniques on a theoretical basis as well as transfer and generalise them independently toward novel research-oriented application scenarios.

Self competences

The students:
- critically reflect the achieved results of their project work
- acknowledge limitations of various approaches for a control-oriented uncertainty modelling.

Module contents

1. Mathematical modeling of uncertainty in linear and nonlinear dynamic systems
2. Stochastic modeling approaches
   - Probability distributions
     - Bayesian state estimation for discrete-time systems (linear/nonlinear) and for continuous-time systems (linear)
     - Linear estimation techniques in an extended state-space (Carleman linearization for special system classes)
3. Estimation of states, parameters and simulation of uncertain processes
   - Monte-Carlo methods
   - Outlook: Markov models
   - Outlook: Bayesian networks
4. Set-based approaches
   - Set-based algorithms: Forward-backward contractor and bisection techniques
   - Interval methods for a verified solution of ordinary differential equations and for a stability proof of uncertain systems
   - Estimation of states and parameters as well as simulation of uncertain processes
5. Outlook: Synthesis of controllers and state observers under an explicit description of uncertainty

Recommended reading

- Rauh, A. Folien/ Skript zur Vorlesung „Uncertainty Modelling for Control in DES”.

Links

Language of instruction
Duration (semesters) 1 Semester Semester
Module frequency every winter term
Module capacity unlimited

Type of module
Teaching/Learning method 1VL + 1Ü

Previous knowledge Basic knowledge of the control of linear time-continuous and/or time-discrete systems and/or robust control

Examination
Examination times Following the event period
Type of examination Portfolio or written exam

Type of course Comment SWS Frequency Workload of compulsory attendance
Lecture 2 WSe 2
Exercises 1 WSe 1
Project 1 WSe 1

Total module attendance time 4 h
inf341 - Robust Control and State Estimation in Digitalised Energy Systems

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Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Technische Informatik
- Master's programme Digitalised Energy Systems (Master) > Digitalised Energy System Automation, Control and Optimisation
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Rauh, Andreas (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
Basic knowledge of the control of linear continuous-time and/or discrete-time systems or of robust control

Skills to be acquired in this module
The students identify fundamentals of robust control and state estimation as well as problem-specific solution techniques and their corresponding software implementation.

Professional competences
The students
- identify fundamentals of robust control and state estimation
- characterize problem-specific solution techniques for different classes of uncertainty
- are aware of reliable software implementations.

Methodological competences
The students
- analyze problems of robust control and state estimation for dynamic systems
- analyze fundamental solution techniques on a theoretical basis
- transfer as well as generalize those independently to new fields of applications.

Social competences
The students
- develop solution ideas for real-life control problems within an accompanying project in small teams
- explain the obtained results in short presentations.

Self competences
The students
- critically reflect the achieved results of their project work
- acknowledge limitations of various approaches for robust control and state estimation.

Module contents

1. Robustness of linear systems/ system analysis
   - Boundary crossing theorem of Frazer and Duncan
   - Mikhailov criterion
   - Khantunov criterion
   - Frequency response approaches

2. Selected control design techniques/ control synthesis
   - Parameter-space approach of Ackermann and Kaesbauer
   - Eigenvalue and eigenvalue domain assignment
   - H-infinity control
   - Frequency response approaches (Sensitivity function approaches in the frequency domain)
3. Robust LMI-based control techniques
   - Lyapunov stability
   - Polytopic uncertainty modeling
   - Optimality of solutions
4. Duality between control and observer synthesis
   - Robust state estimation
   - Sliding mode observers
5. Interval methods: Solution of static and dynamic problems (Enclosing function values, Branch-and-bound techniques, Verification techniques for differential equations)
6. Fundamentals: Fault detection and fault-tolerant control

Recommended reading

- Osterlag, E. Mono- and Multivariable Control and Estimation, Springer-Verlag, 2011
- Rauh, A. Folien/ Skript zur Vorlesung „Robuste Regelung und Zustandsschätzung“
- Weinmann, A. Uncertain Models and Robust Control, Springer-Verlag, 1991

Links

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<th>Language of instruction</th>
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inf502 - Simulation

Module label: Simulation
Module abbreviation: inf502
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Hahn, Axel (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
Programming knowledge, primarily in Java, is mandatory

Skills to be acquired in this module
Simulation is a major tool for gaining knowledge about systems and their behavior. It can be used to gain system understanding and prediction future system status. The module covers mathematical basic as well a basic simulation technology. The module completes itself by addressing application examples. By seminar and practical work, the students get hands on experience of simulation technologies.

Professional competence
The students:
- get an overview on methods, tools and application areas of simulation. They know what simulation can do and what are its limitation. Covered application are mainly in transportation and production domain.

Methodological competence
The students:
- know simulation technologies and model building basics
- understand the handling of time and problems of discretization.
- can solve problems with simulation after lecture. This includes modelling, use of simulation environment and evaluation of results.
- will be learned cause of practical use, the independent handling of research questions and the use of simulation as research method

Social competence
The students:
- gain team and social skills by self-organized development of simulation.

Self-competence
The students:
- can apply simulation technologies on scientific research questions.

Module contents
In lectures the students get background information and simulation basics. Then they apply their knowledge by developing an own simulation by using state of the art simulation environments

Recommended reading

Links
Languages of instruction: German, English
Duration (semesters): 1 Semester
Module frequency: annual
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inf510 - Energy Information Systems

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**Applicability of the module**
- Master Applied Economics and Data Science (Master) > Specialization
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule

**Responsible persons**
- Lehnhoff, Sebastian (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirements

**Skills to be acquired in this module**
The students will learn different approaches to integrate distributed facilities, the regulatory framework, relevant standards and architecture concepts of energy management systems and will be able to apply this knowledge.

**Professional competence**
The students:
- develop and evaluate IT-architectures for energy management systems
- model objects of this domain appropriately
- model energy information systems
- realise and differentiate advanced tasks of decentralised energy management systems

**Methodological competence**
The students:
- identify problems of energy management, analyse these problems systematically and provide solutions
- apply different simulation approaches of decentralised plants and consumers

**Social competence**
The students:
- discuss solutions for energy management systems in the group
- develop use cases in teams
- present self-developed solutions

**Self-competence**
The students:
- reflect their actions with regard to structuring and decomposing systems
- reflect their own use of power as a limited resource

**Module contents**
This module provides the computer science basics for energy management. It provides the requirements of energy supply information systems with the focus on technical components and the requirements of decentralised and renewable energy plants. These are:
- Architectures for energy information systems, e.g. SOA, Seamless Integration Architecture (IEC TC 57), OPC-UA
- Norms and standards of energy industry data models (CIM, 61850)
- Systematisation of energy information system requirements based on ontologies
- Development, analysis and adaption of energy industry reference models and processes
- Methods and technologies to support energy industry processes
- Methods and algorithms to support decision processes of the decentralised energy plants control
- Smart Grid plant communication, particularly for load management
- Methods for modelling and simulation of power supply system dynamics
Recommended reading

- Crastan V.: "Elektrische Energieversorgung II", Springer 2004

Links

Language of instruction | English
Duration (semesters) | 1 Semester
Module frequency | annual
Module capacity | unlimited
Module level | Type of module

Teaching/Learning method | 1VL + 1S
Previous knowledge | none

Examination | Examination times | Type of examination
Final exam of module | At the end of the semester | Student research project or presentation

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Total module attendance time | 56 h
inf511 - Smart Grid Management

Module label: Smart Grid Management
Module abbreviation: inf511
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering Physics (Master) > Schwerpunkt: Renewable Energies
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Sustainable Renewable Energy Technologies (Master) > Mastermodule

Responsible persons:
- Lehnhoff, Sebastian (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirements

Skills to be acquired in this module:
After successful completion of the course the students should be able to understand the existing structures and technical basis of energy systems to produce, transfer and distribute electricity and their interaction and dependency on each other. They should have developed an understanding for necessary IT- and process control technology components, methods and processes to control and operate electrical energy systems. The students are able to estimate and evaluate the requirements and challenges of ICT and computer science which are caused by the development and integration of unforeseeable fluctuations of decentralised plants. The students will be able to estimate the influence of distributed control concepts and algorithms for decentralised plants and consumers in the so called Smart Grid energy systems. Regarding the requirements the students will be able to analyse the safety, reliability, realtime capability and flexibility of Smart Grid energy systems.

Professional competence:
The students:
- understand the existing structures and the technical basis of energy systems producing, transferring and distributing electricity and their interaction and dependency on each other.
- develop an understanding for necessary IT- and process control technology components, methods and processes to control and operate electrical energy systems.
- estimate and evaluate the requirements and challenges of ICT and computer science which are caused by the development and integration of unforeseeable fluctuations of decentralised plants.
- estimate the influence of distributed control concepts and algorithms for decentralised plants and consumers in the so called Smart Grid energy systems.

Methodological competence:
The students:
- analyse the safety, reliability, realtime capability and flexibility of Smart Grid energy systems
- use advanced mathematical methods to calculate networks

Social competence:
The students:
- create solutions in small teams
- discuss their solutions

Self-competence:
The students:
- reflect their own use of electricity as a limited resource

Module contents:
Content of the Module: In this course information technology, economical energy industry and technical basic knowledge and methods are analysed by using concrete Smart Grid approaches. The basic calculation methods for an intelligent grid management are introduced. This module deals with the technical and economical framework for a permissable electrical network as...
well as mathematical modelling and calculation methods to analyse conditions of electrical energy networks (in stationary conditions). These are:

- The organisation of the EU energy market (regulatory framework, responsibility in liberalisation of electrical energy systems)
- Establishment and operation of electrical energy supply networks (network topology, statutory duties of supply, supply quality/system services, malfunctions and protection systems)
- Intelligent network management (Smart Grids), aggregation forms, machine learning approaches

### Recommended reading

**Suggested reading:**

- Crastan V.: "Elektrische Energieversorgung II", Springer 2004

### Links

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### Teaching/Learning method

- 1VL + 1Ü

### Previous knowledge

- none

### Final exam of module

- At the end of the semester
- written or oral exam

### Type of course

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### Total module attendance time

- 56 h
Skills to be acquired in this module

Successfully completing this lecture will enable the students to mathematically model simple controllable electrical generators and consumers and to simulate them together with appropriate control algorithms within smart grid scenarios. To achieve this goal, students will start with deriving computational models from physical models and evaluate them. In order to manage the integration of control algorithms, students are taught the principles of cosimulation using the “mosaik” smart grid co-simulation framework as an example. Students will be able to understand and apply distributed, agent-based control schemes to decentralized energy generators and/or consumers. As a result, students are able to analyze the requirements for successful application to real power balancing regarding capacity utilization, robustness, and flexibility. In addition, students learn the foundations of planning and conducting simulation based experiments as well as the interpretation of the results. Special attention will be paid on establishing a balance between the results’ precision and robustness and the necessary effort (design of experiments) in order to gain as much insight into interdependencies with as few experiments as possible.

Professional competence
The students:

- derive and evaluate computational models from physical models
- use the “mosaik” smart grid co-simulation framework
- analyze the requirements for successful applications to real power balancing regarding capacity utilization, robustness, and flexibility
- name the foundations of planning and conducting simulation based experiments as well as the interpretation of the results
- are aware of the balance between the results’ precision and robustness and the necessary effort (design of experiments) in order to gain as much insight into interdependencies with as few experiments.

Methodological competence
The students:

- model simple controllable electrical generators and consumers
- simulate simple controllable electrical generators and consumers with appropriate control algorithms within smart grid scenarios
- apply distributed agent-based control schemes to decentralized energy generators and/or consumers
- evaluate simulation results
- search information and look into methods to implement models
- propose hypothesis and check their validity with design of experiments methods

Social competence
The students:

- apply the pair programming development technique
- discuss design decisions
- identify work packages and are responsible for it

Self-competence
The students:

- reflect on their own use of power as a limited resource
- accept and use criticism to develop their own behaviour
Module contents

In this practical course students:

- model controllable, modulating electrical energy generators and consumers,
- put their hands on mosaik (installation, description and configuration of scenarios, conduction of simulations),
- learn the principles of agent-based heuristics for optimization problems in future smart grid scenarios,
- learn about the challenges of implementing agent-based mechanisms (multi-criticality, convergency, quality) on the training,
- learn the foundations for choice and design of simulation based experiments.

Recommended reading

Suggested reading:

Smart Grids:

Multiagentensysteme:

Co-Simulation:

Versuchsplanung:
- Klein, B.: "Versuchsplanung - DoE", Oldenbourg, 2011

Links

http://mosaik.offis.de

Language of instruction

German

Duration (semesters)

1 Semester

Module frequency

annual

Module capacity

unlimited

Reference text

Elective module in the master specialization area (energy computer science).

Associated with the modules:

- Energiinformationssysteme
- Smart Grid Management

Module level

Type of module

Teaching/Learning method

1P

Previous knowledge

- Programming with Java
- Programming with Python

Examination

Examination times

Type of examination

Final exam of module

At the end of the semester

Type of examination

Oral exam

Type of course

Practical training

SWS

4

Frequency

SoSe

On-site workload

56 h
inf535 - Computational Intelligence I

Module label: Computational Intelligence I

Module abbreviation: inf535

Credit points: 6.0 KP

Workload: 180 h

Applicability of the module
- Master Applied Economics and Data Science (Master) > Data Science
- Master's Programme Business Informatics (Master) > Akzenträgermodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Human-System Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering
- Master's Programme Environmental Modelling (Master) > Mastermodule

Responsible persons
- Kramer, Oliver (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites: Basics of statistics

Skills to be acquired in this module
After successful completion of the course, students should have acquired the ability to master the presented methods in theory and practice. The students should be able to recognize and model corresponding optimization and data analysis problems themselves and to apply the methods unerringly.

Professional competence
The students:
- recognise optimisation problems
- implement simple algorithms of heuristic optimisation
- critically discuss solutions and selection of methods
- deepen previous knowledge of analysis and linear algebra

Methodological competence
The students:
- deepen programming skills
- apply modeling skills
- learn about the relation between problem class and method selection

Social competence
The students:
- cooperatively implement content introduced in lecture
- evaluate own solutions and compare them with those of their peers

Self-competence
The students:
- evaluate own skills with reference to peers
- realize personal limitations
- adapt own problem solving approaches with reference to required method competences

Module contents
Computational Intelligence comprises intelligent and adaptive methods for optimisation and learning. The module "Computational Intelligence I" concentrates on methods for evolutionary optimisation and heuristic approaches. The exercises introduce and deepen practical aspects of the implementation and algorithmic design, also taking into account application aspects.

Overview of Content:
- foundations of optimisation
- genetic algorithms and evolution strategies
- parameter control and self-adaptation
- runtime analysis
- swarm algorithms
- constrained optimisation
- multi-objective optimisation
- meta-modeling

**Recommended reading**


**Links**

- **Languages of instruction**: English, German
- **Duration (semesters)**: 1 Semester
- **Module frequency**: annual
- **Module capacity**: unlimited
- **Module level**
- **Type of module**
- **Teaching/Learning method**: 1VL + 1Ü
- **Previous knowledge**: - Basics of statistics
- **Examination**: Examination times
- **Type of examination**: Written or oral exam
- **Final exam of module**: At the end of the lecture period
- **Type of course**
  - **Comment**: SWS
  - **Frequency**: Workload of compulsory attendance
  - Lecture: 2 WiSe 28
  - Exercises: 2 WiSe 28
- **Total module attendance time**: 56 h
inf536 - Computational Intelligence II

Module label: Computational Intelligence II
Module abbreviation: inf536
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module
- Master Applied Economics and Data Science (Master) > Data Science
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodulte der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering
- Master's Programme Environmental Modelling (Master) > Mastermodule

Responsible persons
- Kramer, Oliver (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- useful previous knowledge: Linear Algebra, Stochastics

Skills to be acquired in this module

In the lecture "Convolutional Neural Networks" you will learn the basics of Convolutional Neural Networks, from methodological understanding to implementation.

Professional competence
The Students:
- will learn Deep Learning expertise, which are essential qualifications as AI experts and Data Scientists.

Methodological competence
The Students:
- learn the methods mentioned as well as the implementation in Python, Numpy and Keras.

Social competence
The Students:
- are encouraged to discuss the taught content in groups and work together to implement the programming tasks in the exercises.

Self-competence
The Students:
- are guided to conduct independent research on advanced methods as the teaching field changes dynamically

Module contents
Students learn the basics of machine learning and in particular the topics of dense layers, cross-entropy, backpropagation, SGD, momentum, Adam, batch normalization, regularization, convolution, pooling, ResNet, DenseNet, and convolutional SOMs

Recommended reading
- Deep Learning by Aaron C. Courville, Ian Goodfellow und Yoshua Bengio

Links
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<tr>
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| Total module attendance time | 56 h |
inf537 - Intelligent Systems

Module label
Intelligent Systems

Module abbreviation
inf537

Credit points
6.0 KP

Workload
180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
Production oriented business informatics

Skills to be acquired in this module

Professional competence
The students:
- name the structure of agent-based systems
- use problem-solving methods for complex problems
- characterise the application area of process planning
- evaluate the suitability of processes regarding to specific problems

Methodological competence
The students:
- assign problem-solving methods to different problems

Social competence
The students:
- implement selected methods in small teams

Self-competence
The students:
- develop own solutions for given problems

Module contents
A lot of application areas use “intelligent” problem-solving methods. These are the main focus of this lecture. They will be illustrated by examples in order to enhance the students' problem-solving abilities. These include:

- A brief introduction into AI
- Agent systems and Solution methods of AI like heuristics, meta-heuristics, soft computing methods. To apply and foster the contents of the lecture, an intelligent planning system is implemented in practical exercises.

Recommended reading
Suggested reading:
- Ghallab/ Nau/Traverso: Automated Planning, Morgan Kaufman, 2004

Links
www.wi-ol.de

Languages of instruction
German, English

Duration (semesters)
1 Semester

Module frequency
annual

Module capacity
unlimited
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inf538 - Management of IT-Services

Module label: Management of IT-Services
Module abbreviation: inf538
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons:
- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirements

Skills to be acquired in this module:

Professional competence
The students:
- characterise problems that occur during the operation of large-scale operating systems
- characterise conceptional, technical, economical and organizational problem-solving processes
- use these concepts to solve problems validly

Methodological competence
The students:
- describe a current problem area based on information from the internet and literature

Social competence
The students:
- present their findings on a problem area
- discuss their results regarding a specific application area

Self-competence
The students:
- reflect actual concepts with regard to specific application areas

Module contents:

Content of the Module:
"Adaptive Computing" deals with the field of concepts and solutions to manage large scale application systems or dynamic data centers. Technically oriented solutions like the configuration of data centers such as the hard- and software virtualization, the high availability, the storage management and the identity management are not the only contributions of Adaptive Computing. Others are organisational aspects of companies, such as personnel planning and service agreements. This module provides and compiles current topics of Adaptive Computing. The module also presents and evaluates several Adaptive Computing technologies. Current HW-/SW-concepts of large-scale application systems, strategies, service management and security concepts are specifically included. The lecture introduces current concepts and solutions for the management of dynamic data centers. Among others, the following subjects are provided:

- IT-Strategy, -Organisation
- ITIL (overview)
- Service-Management Tools (e.g. OTRS)
- Outsourcing
- Security (policies, privacy, data security, safety)
- Spatial design of data centers
- HW-Strategies: Cluster, Storage, ...
- Virtualization
- IdM
- Portals
- Configuration management
- Accounting, performance calculation and evaluation, performance indicators
- SOA, EAI
- Controlling tools, Monitoring
Recommended reading

Suggested reading:

- current company data
- current materials from internet
- Tiemeyer, Ernst: Handbuch IT-Management: Konzepte, Methoden, Lösungen und Arbeitshilfen für die Praxis, Hanser, 2006

Links

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Total module attendance time 56 h
inf541 - Data Challenge

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (module responsibility)

**Prerequisites**
useful previous knowledge: Business Intelligence I, Business Intelligence II

**Skills to be acquired in this module**
After successful completion of the course, students should be able to answer specific, entrepreneurial questions with the help of data-driven methods. The handling of data should be mastered unerringly in the programming languages Python and/or R. Furthermore, competences in the field of algorithmics and data storytelling should be developed.

The module teaches basic skills in the field of data science and the application of various methods and algorithms. The cooperation with a practice partner ensures that the students work on a problem that is as real and practical as possible. By working independently on the problem and the final presentation of the results, further soft skills of the students will be trained.

**Professional competence**
The students:
- learn how to handle structured and unstructured data sources.
- acquire practical knowledge about different methods of data science.
- learn basic procedures in the implementation of data science projects.
- follow and refine the implementation of the practical learning by means of a partly given model scenario, but also by self-initiatives.

**Methodological competence**
The students:
- are able to explore and analyze data sets
- recognize connections in large data sets
- form a hypothesis for the solution of a business problem.

**Social competence**
The students:
- work in groups, identify work packages and take on responsibility for the jobs assigned to them.
- discuss and introduce the results on a functional level.

**Self-competence**
The students:
- reflect their approach on the basis of self-defined goals.
- collect and analyze required information.
- prepare the collected information in a target group-oriented manner.

**Module contents**
If methodological competence in the field of data science is to be learned and expanded, this is usually only possible with the help of open available, idealized data sets and exemplary tasks. Basic programming skills can be acquired in this way, but dealing with real business problems and solving them with the help of data science methods can only be learned through practice. In this module, a real problem of a practice partner is presented, this partner provides data and domain knowledge and then a data-centered solution for this problem must be designed and implemented independently.

**Within the module, the following topics are dealt with:**
- Exploration and analysis of data
- Methods of data science (e.g. deep learning)
- Dealing with programming languages and development frameworks (R, Python, Tensorflow)
- Hypothesis Formation and Data Storytelling
### Recommended reading


### Links

| Links       | https://uol.de/viba |

### Language of instruction

| Language of instruction | German |

### Duration (semesters)

| Duration (semesters) | 1 Semester |

### Module frequency

| Module frequency | annual |

### Module capacity

| Module capacity | 30 |

### Module level

| Module level | |

### Teaching/Learning method

| Teaching/Learning method | PR (Blockseminar) |

### Previous knowledge

| Previous knowledge | useful previous knowledge: Business Intelligence I, Business Intelligence II |

### Examination

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### Type of course

| Type of course | Practical training |

### SWS

| SWS | 4 |

### Frequency

| Frequency | SoSe oder WiSe |

### On-site workload

| On-site workload | 56 h |
inf604 - Business Intelligence I

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Applicability of the module
- Master Applied Economics and Data Science (Master) > Data Science
- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Marx Gómez, Jorge (authorised to take exams)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- No participant requirement

Skills to be acquired in this module
Objective of the module/skills:
Current module provides basics of business intelligence with focus on enterprises and strong emphasis on data warehousing technologies. Students of the course are provided with knowledge, which reflects current research and development in a data analytic domain.

Professional competence
The students:
- name and recognize the role of business intelligence as part of daily business process
- being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies
- obtain theoretical knowledge about data collection and modelling processes, including most applicable approaches and best practices

Methodological competence
The students:
- being able to execute typical tasks of business intelligence, and also being able to deepen knowledge on different approaches and methods
- gain a hands on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge in most efficient ways

Social competence
The students:
- build solutions based on case studies given to the group, for example solving the issue of a factless fact table
- discuss solutions on a technical level
- present obtained case studies solutions as part of the exercises

Self-competence
The students:
- critically review provided data and information

Module contents
Data warehouse technology together with business intelligence are increasingly being used by business in order to get better decision support and enrich ongoing processes with data-rich decisions. Data warehouse technology enables an integration of data from heterogeneous sources, whereas business intelligence builds data processing on top of it. For instance, business intelligence allows to build reporting on very large volumes of data (including historical) coming primarily from data warehouse.

As part of the current module following contents are taught:
Definition and scope of business intelligence.
- Procedures and objectives of data warehousing.
- Process of extracting, transforming and loading (ETL) of data.
- Phases of data modelling, data capturing and reporting in conjunction with a plausible case studies/scenarios.
- Prospects for further and evolving topics for business intelligence (e.g. Adaptive Business Intelligence, In-Memory Computing, etc.)
- Introduction to Data Mining.
- Case studies based practical exercises and assessments in order to impart practical knowledge.

Recommended reading
- Marx Gómez, Rautenstrauch, Cissek (2008): Einführung in die Business Intelligence mit SAP NetWeaver 7.0.

Links
- http://www.wi-ol.de

Languages of instruction
- German, English

Duration (semesters)
- 1 Semester

Module frequency
- annual

Module capacity
- unlimited

Module level

Type of module

Teaching/Learning method
- 1VL + 1Ü

Previous knowledge
- none

Examination

Examination times

Type of examination
- At the end of the lecture period
- Written exam max. 120 minutes

Type of course
- Lecture
- Exercises

Comment
- 2
- 2

SWS
- WiSe 28
- WiSe 28

Frequency
- WiSe
- WiSe

Workload of compulsory attendance
- 56 h

Total module attendance time
- 56 h
### inf607 - Business Intelligence II

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#### Applicability of the module
- Master Applied Economics and Data Science (Master) > Data Science
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

#### Responsible persons
- Marx Gómez, Jorge (authorised to take exams)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites
No participant requirement

#### Skills to be acquired in this module
Current module provides advanced business intelligence, data science with focus on enterprises and strong emphasis on big data and data analytics. Students of the course are provided with knowledge, which reflects current research and development in a data analytics domain.

**Professional competence**
The students:
- name and recognize the role of data analytics / data science as past of a daily business process in a particular company
- able to organize from management perspective data analysis project
- being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies
- obtain theoretical knowledge about data collection and modelling processes, including state of the art approaches and available best practices

**Methodological competence**
The students:
- being able to execute typical tasks of data analysis, and also being able to proceed deeper with respect to different approaches and methods
- gain a hands on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge

**Social competence**
The students:
- build solutions based on case studies given to the group, for example design of regression model based on provided dataset
- discuss solutions on a technical level
- present obtained case studies solutions as part of the exercises

**Self-competence**
The students:
- critically review provided offered information

#### Module contents
After current course students will get advanced knowledge in the domains such as business intelligence and data analytics. Besides that, students will have a chance to have a deeper look into related technical fields such as InMemory Computing, Data Mining and Machine Learning, Big Data Processing with Distributed Systems (e.g. Apache Hadoop / Spark) from both, research and practical perspectives. Students will be provided with real-world experience gather from business intelligence and data science related projects. Materials of the course are believed to be justified with current demands of data analytics market. Thus, providing students with relevant knowledge in order to give them advantages in future job.
Recommended reading

- Jürgen Cleve, Uwe Lämmel (2014): "Data mining" (Deutsch)
- Max Bramer (2013): "Principles of data mining" (English)
- Ian Witten, Eibe Frank, Mark Hall (2011): "Data mining : practical machine learning tools and techniques" (English)
- Jure Leskovec, Anand Rajaraman, Jeffrey Ullman (2014): "Mining of massive datasets" (English)

Links
- http://www.wi-ol.de/

Languages of instruction
- German, English

Duration (semesters)
- 1 Semester

Module frequency
- annual

Module capacity
- unlimited

Module level

Type of module

Teaching/Learning method
- 1VL + 1S

Previous knowledge
- none

Examination
- Examination times

Final exam of module
- At the end of the lecture period

Type of course

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Total module attendance time
- 56 h
## inf650 - Transport Systems

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### Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

### Responsible persons
- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
- Production-oriented business informatics

### Skills to be acquired in this module

#### Objective of the module/skills:
The Module Transport systems deals with planning and controlling systems of internal and external company logistics as well as public transport. It provides basic knowledge and recent research topics. The focus is on a resource orientated holistic view of company logistics as well as the planning of transport infrastructure. Furthermore, trends such as autonomous vehicles and intelligent transport systems are discussed.

#### Professional competence
The students:
- name the basics of planning and controlling company logistics
- assess transport systems of companies
- name methods and approaches of computer aided transport systems and classify them
- characterise software to plan complex logistics

#### Methodological competence
The students:
- display topics and concepts of transport systems
- simulate transport and its systems with appropriate methods

#### Social competence
The students:
- work in groups
- discuss their results appropriately

#### Self-competence
The students:
- realise their limits while working on a project containing aspects of modelling and implementation
- question the presentation of their results

### Module contents
- Transport and logistics concepts
- Data acquisition of company logistics
- Planning- and simulation software for complex logistics- and transport processes
- Energy- and resource efficient transport systems
- Resource oriented transport cost calculations (e.g. CO2, noise pollution)
- Planning models for transport infrastructure

### Recommended reading

### Suggested reading:

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<th><a href="http://wi-ol.de">http://wi-ol.de</a></th>
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inf651 - Environmental Management Information Systems I

Module label: Environmental Management Information Systems I

Module abbreviation: inf651

Credit points: 6.0 KP

Workload: 180 h

Applicability of the module:
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM - interdisziplinär
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Master's Programme Sustainability Economics and Management (Master) > Additional Modules

Responsible persons:
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirement

Skills to be acquired in this module:
This module completes the knowledge and abilities gained in the field of Environmental Informatics and it creates a strong reference to up to date topics in the field of sustainability. The content taught in this module can directly be applied in an upcoming study and professional career.

Professional competence:
The students:
- are able to classify and explain the sustainability paradigm
- are aware of the current status of sustainability reporting
- are able to define and to model material flows
- have obtained know-how in the field of corporate environmental management information systems (CEMIS)

Methodological competence:
The students:
- implement CEMIS
- apply different techniques and methods to case studies
- develop new case studies in teams

Social competence:
The students:
- are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them
- present and discuss their own results with the team and the other members of the course

Self-competence:
The students:
- learn about their own limitations and learn to accept criticism in order to strengthen their own abilities

Module contents:
This course teaches methods, approaches and techniques in the field of information processing in order to support solutions to problems that arise from companies' impact on the environment. In particular, ICT supported approaches of production-integrated environmental protection, environmental controlling and reporting are introduced and discussed. In order to enable the integration of such approaches into environmental protection, environmental management and its systems are taught as well.

The content in detail:
- environmental management as a basis for sustainability
- sustainability and material flow management
- strategic environmental management
- eco-controlling life cycle
- characteristics and system architectures of CEMIS
- standard software systems
- environmental accounting systems

Recommended reading


Links
http://www.wi-ol.de

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
annual

Module capacity
unlimited

Module level

Type of module

Teaching/Learning method
1VL + 1Ü

Previous knowledge
none

Examination
Examination times

Type of examination

Final exam of module
At the end of the lecture period
exercises and written exam (max. 120 min.)

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Total module attendance time
56 h
**inf652 - Production-oriented Business Informatics**

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| Applicability of the module      | • Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
• Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
• Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons              | • Sauer, Jürgen (module responsibility)  
• Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                    | No participant requirement               |
| Skills to be acquired in this module The module deepens the contents of the modules „Wirtschaftsinformatik“ and „Wirtschaftsinformatik/Informationsmanagement“. The students will be able to contextualise IT systems and their functions in companies. They are able to participate in the implementation of IT systems in companies. The students know the essential tasks of materials management, production planning and controlling, warehousing, acquisition and supply chain management. Professional competence The students:
• name and differentiate the basics of business informatics and information management  
• classify IT systems and their functions in companies  
• name and characterise the essential tasks of materials management, production planning and controlling, warehousing, acquisition and supply chain management Methodological competence The students:
• transfer a holistic development process of production planning and control  
• implement IT systems in businesses Social competence The students:
• participate in implementing IT systems in companies  
• construct and present computational solutions to groups and within their work group  
• integrate professional and objective criticism in their own and others’ results Self-competence The students:
• recognize the planning horizon for IT systems  
• reflect their role and skills to implement IT systems in businesses |
| Module contents The module "Production-oriented Business Informatics" deals especially with production planning and control processes affected by process planning tasks, as well as classic problems of industrial production. The lecture is focussed on the application of information systems in industrial production companies. Priorities are order flow business processes and PPS-/ERP-Systems. Case studies and demonstrations illustrate the application of these systems. |
| Recommended reading               | • Kurbel, Karl: Produktionsplanung und -steuerung im Enterprise Resource Planning und Supply Chain Management, Oldenbourg Verlag, 2005  
• Further literature will be announced in the lecture |
<p>| Language of instruction           | German                                   |
| Language of instruction           | German                                   |
| Language of instruction           | German                                   |</p>
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<td>At the end of the lecture period</td>
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### inf653 - ERP Technologies

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#### Applicability of the module

- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

#### Responsible persons

- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites

No participant requirement

#### Skills to be acquired in this module

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<thead>
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<th>Learning objectives</th>
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<tr>
<td></td>
<td>The students:</td>
</tr>
<tr>
<td></td>
<td>describe ERP systems in compliance with functions and technologies</td>
</tr>
<tr>
<td></td>
<td>identify state-of-the-art and future architectures of ERP systems</td>
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<tr>
<td></td>
<td>discuss the usage of core technologies (also in practical case studies, for example with SAP NetWeaver)</td>
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<tr>
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<tbody>
<tr>
<td>The students:</td>
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<tr>
<td>categorize fundamental technologies in combination with other enterprise-wide information systems</td>
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<tr>
<td>apply the presented methods in practical contexts</td>
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<table>
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<tr>
<th>Social Competence</th>
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<tbody>
<tr>
<td>The students:</td>
</tr>
<tr>
<td>construct solutions to given problems in groups</td>
</tr>
<tr>
<td>present solutions to computing science problems before groups</td>
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<table>
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<tr>
<th>Self-competence</th>
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</thead>
<tbody>
<tr>
<td>The students:</td>
</tr>
<tr>
<td>recognize the limit of their capacity in implementing and customizing of business application systems</td>
</tr>
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</table>

#### Module contents

The module provides the following content:

- Overview of the components of ERP systems and their functionality and administration
- In-depth analysis of ERP system architecture under consideration of surface structures and user management in ERP systems, with focus on of data storage, particularly the used data models and database structures, backup and recovery strategies
- Deployment of ERP applications in form of application service providing, including the technical characteristics of this business model, especially Special Administration, delimitation and monitoring tasks for systems, which at the same time be provided several customers
- Lecture will be accompanied by SAP case studies.

#### Recommended reading


Links http://www.wi-ol.de

Language of instruction German

Duration (semesters) 1 Semester

Module frequency annual

Module capacity unlimited

Module level

Type of module

Teaching/Learning method 1VL + 1Ü

Previous knowledge none

Examination

Examination times Type of examination

Final exam of module End of lecture period Portfolio or practical exercises and written exam

Type of course Comment SWS Frequency Workload of compulsory attendance

Lecture 2 WiSe 28

Exercises 2 WiSe 28

Total module attendance time 56 h
### inf654 - Mobile Commerce

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**Applicability of the module**
- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
- No participant requirement

**Skills to be acquired in this module**

**Professional competence**
The students:
- define and encompass MC
- explain the development stages of MC
- are aware of the current developments within MC and are able to classify them
- get to know technical essentials, functionalities and standards of wireless ICT
- assess the fields of application and limitations of wireless ICT
- examine the relevant mobile devices and their respective operating systems, know their characteristics and evaluate their fields of application
- examine market participants, assess business models, optimize business processes
- gain insight into specifics via examples and exercises

**Methodological competence**
The students:
- get to know security aspects and specifics of mobile application design
- prototypically develop an Android application
- prepare and give presentations
- develop a concept of a business model for an Android application

**Social competence**
The students:
- work on their project in groups of three

**Self-competence**
The students:
- reflect their own group-dynamic activities in respect of a mutual goal (successfully finish their project)

**Module contents**
See above

**Recommended reading**
- Also all materials provided within the lecture

**Links**
http://vlba.wi-ol.de

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
annual

**Module capacity**
unlimited

**Module level**
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| Total module attendance time | 56 h |
inf655 - IT-Controlling

Module label IT-Controlling
Module abbreviation inf655
Credit points 6.0 KP
Workload 180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
No participant requirement

Skills to be acquired in this module
This module emphazises the importance of IT-Controlling within an enterprise. The students gain knowledge on practically orientated technologies in order to leave a better understanding for the application and conversion possibilities of IT-Controlling.

Professional competence
The students:
- name general tasks and functions of IT-Controlling.
- recognize the importance strategical IT-Controlling applications.
- learn strategies and methods of IT-Controlling.
- identify the existence of an IT-Strategy as a pre condition of IT-Controlling.
- know about the risks of IT-Outsourcing.
- use IT-Controlling tools (e.g. information systems, portfolio analysis, benchmarking IT-Reporting).

Methodological competence
The students:
- use their knowledge by independently compiled presentations on recent IT-Controlling subjects.

Social competence
The students:
- discuss their results essentially and appropriately in this subject.
- present their subjects to the group.

Self-competence
The students:
- understand and analyse their own state of knowledge.
- reflect their own effects on groups

Module contents
The employment of information technologies for enterprises is usually a key factor. By the change of our society to an information society, information gains more and more importance and takes a central role within ICT systems. The specifics of the ICT area cannot be supported by the classical economic controlling. The application of a strategical IT-Controlling becomes more and more important. The result of a study shows that in the meantime in about 80% of the German enterprises an ICT strategy was compiled. However, the study makes also clear, that about two out of three enterprises use no methods of strategical IT-Controlling. The new discipline of IT-Controlling provides plans and methods to avoid isolated applications.

Recommended reading
- Gadatsch, A: IT-Controlling: Praxiswissen für IT-Controller und Chief-Information-Officer. Springer Verlag, 2012
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**Module level**

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**Final exam of module**

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**Total module attendance time**

| Total module attendance time | 56 h |
inf657 - Product Engineering

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Applicability of the module

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons

- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites

- No participant requirement

Skills to be acquired in this module

Focus of this module is to learn and apply the product engineering process. A project will enable the students to design a product from the idea to the prototype. More specifically, a systematic, partial domain-specific, approach to solve technical problems and aspects of project management will be learned. Regular meetings are used to train the presentation capabilities of the students and to schedule working packages within the teams.

Professional competence

The students:

- learn and try out the handling of virtual and physical prototypes
- learn and try out the construction and validation of virtual prototypes with the aid of CAD-applications
- learn and combine different basic development concepts from the mechanical engineering, microelectronics, control engineering and software engineering

Methodological competence

The students:

- learn and try out project management concepts
- learn and recognise the connections of different development concepts from different fields, e.g. mechanical engineering, control engineering, microelectronics and software engineering
- develop own products with creativity techniques
- schedule and organise the product development supported by project management techniques independently
- learn the systematic refining of their own product idea with SysML
- design and test products with state-of-the-art CAD-applications

Social competence

The students:

- impart their structure and mode of action to other people
- develop their own products in small teams
- present their solutions to groups
- integrate criticism to their solutions
- support other groups by giving appropriate criticism

Self-competence

The students:

- recognise and reflect their own limitations to get familiar and to plan a project in an unknown field (e.g. maritime construction/industries)

Module contents

This module is a lecture accompanied by a hands-on project. The students work on one product development task. The product development starts with the idea-finding/brainstorming process which is used to create a digital product concept. During the semester a digital prototype will be created and validated by its initial requirements. Finally, a physical prototype is produced with a 3D-Printer (Rapid Prototyping). The progress of the project has to be documented and presented at different milestones.

Recommended reading

68 / 223
Ehrlenspiel (2003): Integrierte Produktentwicklung

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Total module attendance time 56 h
**Module label**  
Environmental Management Information Systems II

**Module abbreviation**  
inf659

**Credit points**  
6.0 KP

**Workload**  
180 h

**Applicability of the module**
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM - interdisziplinär
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Master's Programme Sustainability Economics and Management (Master) > Additional Modules

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirement

**Skills to be acquired in this module**
This course aims at examining emerging research questions in the field of corporate environmental management information systems (CEMIS). After finishing this course, the students will have extensive knowledge regarding Business Environmental Informatics. In addition, they will be aware of recent research topics and challenges as well as relevant software solutions and practical projects.

**Professional competence**
The students:
- will obtain extensive knowledge in the field of CEMIS
- know emerging research questions and challenges as well as software solutions and projects

**Methodological competence**
The students:
- find their own solutions or apply already existing approaches to new and unsolved questions in the field of CEMIS
- capture required data, analyse it and present it to their team or the whole group

**Social competence**
The students:
- are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them
- present and discuss their own results with the team and the other members of the course

**Self-competence**
The students:
- learn about their own limitations and learn to accept criticism in order to strengthen their own abilities

**Module contents**
A strong social pressure forces enterprises to question their current way of implementing their business and to include different aspects of sustainability into their strategies and operational actions. Such a rethinking of one’s business is supported by corporate environmental management information systems. Such systems aim at optimising the energy and resource usage, emission and waste minimisation as well as production integrated environmental protection. Of course they support the fulfillment of legal requirements such as waste management or hazardous material handling. The module will cover:
- recent and emerging research questions and topics related to the field of CEMIS as well as Business Environmental Informatics.
- discussion and hands-on experience of standard software systems and newly established solutions.
• applying the knowledge obtained to the definition of new as well as on solving new case studies.

**Recommended reading**

- Marx Gómez, Jorge, Scholtz, Brenda (Hrsg.) (2016): Information Technology in Environmental Engineering. Springer International Publishing

**Links**

- http://www.wi-ol.de

**Languages of instruction**

German, English

**Duration (semesters)**

1 Semester

**Module frequency**

annual

**Module capacity**

unlimited

**Reference text**

Type and language of program will be announced prior to the beginning of the course

**Module level**

- Type of module
- Teaching/Learning method: 1VL + 1Ü or 1S
- Previous knowledge: none

**Examination**

- Examination times: Usually 2 weeks after the end of the lecture period
- Type of examination: Seminar paper and presentation or term paper

**Final exam of module**

- Type of course

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**Total module attendance time**: 56 h
inf660 - Sustainability Informatics

Module label: Sustainability Informatics
Module abbreviation: inf660
Credit points: 6.0 KP
Workload: 180 h

Type and language of program will be announced prior to the beginning of the course. The course is recognised as a practical project in the Master's programme Sustainability Economics and Management.

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons:
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirement

Skills to be acquired in this module:
After finishing this course, students should be able to set up a sustainability report tailored for different target groups for any kind of organization. The students will be enabled to know and apply different available standards and guidelines as well as to estimate the influence of data defects and the feasibility of recent information and communication technology. This course emphasizes the importance of sustainability reporting as a means of an organization's communication (internal and external) and provides an overview on relevant indicators, standards and guidelines. Based on that the handling of data defects and missing data as well as different approaches of reporting will be discussed. In addition, the specific requirements of different target groups regarding content and presentation of a report will be discussed as well.

Professional competence:
The students:
- are aware of different indicators, standards and guidelines and know when to apply which.
- know different approaches of data capturing, interpolation of missing or corrupt data as well as the influence of each of these issues on the validity of a report.
- implement concepts for tailored target group orientation.

Methodological competence:
The students:
- prepare a small sustainability report based on their decision which standard or guideline to use.
- capture existing data and analyse it.
- prepare a tailored target oriented presentation of their results.

Social competence:
The students:
- are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them.
- present and discuss their own results with the team and the other members of the course.

Self-competence:
The students:
- learn about their own limitations and learn to accept criticism in order to strengthen their own abilities.

Module contents:
The following topics will be covered in this module:
- different definitions of the term sustainability.
- the importance of sustainability reporting as a means of an organisation's communication.
- LCA, environmental accounting, supply chain management as data...
sources.
- semantic, comparability and transformation of indicators, standards and guidelines.
- interpolation and interpretation of data defects.
- how to report (e.g. knowledge management, document engineering, integrated reporting, different target groups).

Recommended reading


Links

http://vlba.wi-ol.de

Languages of instruction

German, English

Duration (semesters)

1 Semester

Module frequency

unlimited

Reference text

Die Lehrveranstaltung wird im Masterstudiengang Sustainability Economics and Management als practical project anerkannt.

Module level

Type of module

1VL + 1Ü oder 1PR

Previous knowledge

none

Examination

Type of examination

Final exam of module

Seminar paper and presentation or exercises and exam

Type of course | Comment | SWS | Frequency | Workload of compulsory attendance
---|---|---|---|---
Lecture | | 2 | SoSe | 28
Übung oder Praktikum | | 2 | SoSe | 28
Total module attendance time

56 h
inf661 - Digital Transformation

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<td>Credit points</td>
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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirements

**Skills to be acquired in this module**

**Professional competence**
The students:
- recognize basic properties and facts of a digital transformation for companies
- devise different terms of digital transformation
- expose actual introduction projects
- compile practical knowledge by dividing goals of enabler and actors of a digital transformation
- obtain basic knowledge of key competences such as IT-Security, Data Analytics, Big Data, Cloud Computing
- identify digital business models within the specific development potential

**Methodological competence**
The students:
- determine and analyse required information
- prepare the given information for specific target groups
- establish an analytical understanding of digital enterprise structures within key competences and applications

**Social competence**
The students:
- work in groups, identify work packages and take on responsibility for the jobs assigned to them
- discuss and introduce the results on a functional level

**Self-competence**
The students:
- reflect their actions on the basis of self defined objectives
- analyse their own state of knowledge

**Module contents**
Within the lecture the upcoming topics are discussed:
- definition and introduction of digital transformation
- success factors, market changes and introductory projects
- enabler of a digital transformation (competences, applications and structures)
- digital business models and networks - actors of a digital transformation
- industry 4.0 in the context of a digital transformation

**Recommended reading**

<table>
<thead>
<tr>
<th>Links</th>
<th><a href="http://www.wi-ol.de">http://www.wi-ol.de</a></th>
</tr>
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Total module attendance time  56 h
inf690 - Special Topics in 'Business Informatics' I

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| Applicability of the module   | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
                            | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
                            | - Master's Programme Computing Science (Master) > Angewandte Informatik  |
| Responsible persons           | Marx Gómez, Jorge (module responsibility)  
                            | Sauer, Jürgen (module responsibility)  
                            | Staudt, Philipp (module responsibility)  
                            | Lehrenden, Die im Modul (authorised to take exams)  |
| Prerequisites                 | No participant requirements                |
| Skills to be acquired in this module | This module integrates current developments in the field in adequate study courses.  
                            | **Professional competences**  
                            | The students:  
                            | - define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general  
                            | - recognise and evaluate applied techniques and methods of their subject and are aware of their limits  
                            | - identify, structure and solve problems/tasks, also in new or developing subject areas  
                            | - apply state of the art and innovative methods to solve problems, if necessary from other disciplines  
                            | - are aware of the current limits and contribute to the development of computer science research and technology  
                            | - discuss and evaluate recent computer science developments  
                            | **Methodological competences**  
                            | The students:  
                            | - evaluate and apply tools, technology and methods sophisticatedly  
                            | - combine new and original approaches and methods creatively  
                            | - evaluate problems/tasks, including new or developing subject areas of their discipline and  
                            | - apply computer science methods for solutions and research  
                            | **Social competences**  
                            | The students:  
                            | - support team process by their abilities  
                            | **Self-competences**  
                            | The students:  
                            | - pursue the overall and special computer science development critically  
<pre><code>                        | - implement innovative professional activities effectively and independently  |
</code></pre>
<p>| Module contents               | See assigned course description             |
| Recommended reading           | As announced in course                     |
| Language of instruction       | German                                     |
| Duration (semesters)          | 1 Semester                                 |
| Module frequency              | irregular                                  |
| Module capacity               | unlimited                                  |
| Module level                  | Type of module 2 events from V, S, Ü, P, PR |
| Previous knowledge            | none                                       |</p>
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### inf691 - Special Topics in 'Business Informatics' II

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Skills to be acquired in this module**
This module integrates current developments in the field, especially with a focus on corporate environmental management information systems, in adequate study courses.

**Professional competences**
- The students:
  - define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
  - recognise and evaluate applied techniques and methods of their subject and are aware of their limits
  - identify, structure and solve problems/tasks, also in new or developing subject areas
  - apply state of the art and innovative methods to solve problems, if necessary from other disciplines
  - are aware of the current limits and contribute to the development of computer science research and technology
  - discuss and evaluate recent computer science developments

**Methodological competences**
- The students:
  - evaluate and apply tools, technology and methods sophisticatedly
  - combine new and original approaches and methods creatively
  - evaluate problems/tasks, including new or developing subject areas of their discipline and
  - apply computer science methods for solutions and research

**Social competences**
- The students:
  - support team process by their abilities

**Self-competences**
- The students:
  - pursue the overall and special computer science development critically
  - implement innovative professional activities effectively and independently

**Module contents**
See assigned course description

**Recommended reading**
As announced in course

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
irregular

**Module capacity**
unlimited

**Module level**

**Type of module**

**Teaching/Learning method**
2 events from V, S, Ü, P, PR
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inf692 - Special Topics in 'Business Informatics' III

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Skills to be acquired in this module**
This module integrates current developments in the field, especially with a focus on business intelligence, in adequate study courses.

**Professional competences**
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

**Methodological competences**
The students:
- evaluate and apply tools, technology and methods sophisticatedly
- combine new and original approaches and methods creatively
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research

**Social competences**
The students:
- support team process by their abilities

**Self-competences**
The students:
- pursue the overall and special computer science development critically
- implement innovative professional activities effectively and independently

**Module contents**
See assigned course description

**Recommended reading**
As announced in course

**Links**

| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | irregular |
| Module capacity | unlimited |

**Module level**

<table>
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<tbody>
<tr>
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**Previous knowledge**
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<td>Portfolio or presentation or oral exam</td>
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**Type of course**
VA-Auswahl

| SWS | 4 |
| Frequency | SoSe oder WiSe |
| On-site workload | 56 h |
**inf693 - Special Topics in 'Business Informatics' IV**

<table>
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<td>Workload</td>
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| Applicability of the module | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons | - Marx Gómez, Jorge (module responsibility)  
- Sauer, Jürgen (module responsibility)  
- Staudt, Philipp (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites | No participant requirements |
| Skills to be acquired in this module | This module integrates current developments in the field in adequate study courses.  
**Professional competences**  
The students:  
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general  
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits  
- identify, structure and solve problems/tasks, also in new or developing subject areas  
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines  
- are aware of the current limits and contribute to the development of computer science research and technology  
- discuss and evaluate recent computer science developments  
**Methodological competences**  
The students:  
- evaluate and apply tools, technology and methods sophisticatedly  
- combine new and original approaches and methods creatively  
- evaluate problems/tasks, including new or developing subject areas of their discipline and  
- apply computer science methods for solutions and research  
**Social competences**  
The students:  
- support team process by their abilities  
**Self-competences**  
The students:  
- pursue the overall and special computer science development critically  
- implement innovative professional activities effectively and independently |
<p>| Module contents | See assigned course description |
| Recommended reading | As announced in course |
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | irregular |
| Module capacity | unlimited |
| Module level | |
| Type of module | |
| Teaching/Learning method | 2 events from V, S, Ü, P, PR |
| Previous knowledge | none |</p>
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<th>Type of examination</th>
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</table>
inf694 - Current Topics in 'Business Informatics' I

Module label | Current Topics in 'Business Informatics' I
Module abbreviation | inf694
Credit points | 3.0 KP
Workload | 90 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
No participant requirements

Skills to be acquired in this module
This module integrates current developments in the field in adequate study courses.

Professional competences
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

Methodological competences
The students:
- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

Social competences
The students:
- communicate with users and experts convincingly

Self-competences
The students:
- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

Module contents
See assigned course description

Recommended reading
As announced in course

Links

Language of instruction | German
Duration (semesters) | 1 Semester
Module frequency | irregular
Module capacity | unlimited
Module level |
Teaching/Learning method | 1S or 1VL
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inf695 - Current Topics in 'Business Informatics' II

Module label | Current Topics in 'Business Informatics' II
Module abbreviation | inf695
Credit points | 3.0 KP
Workload | 90 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
No participant requirements

Skills to be acquired in this module
This module integrates current developments in the field, especially with a focus on corporate environmental management information systems, in adequate study courses.

Professional competences
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

Methodological competences
The students:
- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

Social competences
The students:
- communicate with users and experts convincingly

Self-competences
The students:
- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

Module contents
See assigned course description

Recommended reading
As announced in course

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
irregular

Module capacity
unlimited

Module level

Type of module
<table>
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inf696 - Current Topics in 'Business Informatics' III

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**Applicability of the module**

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**

- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

No participant requirements

**Skills to be acquired in this module**

This module integrates current developments in the field, especially with a focus on business intelligence, in adequate study courses.

**Professional competences**

The students:

- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

**Methodological competences**

The students:

- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

**Social competences**

The students:

- communicate with users and experts convincingly

**Self-competences**

The students:

- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

**Module contents**

See assigned course description

**Recommended reading**

As assigned in course

**Links**

**Language of instruction**

German

**Duration (semesters)**

1 Semester

**Module frequency**

irregular

**Module capacity**

unlimited

**Module level**

**Type of module**

Teaching/Learning method 1S + 1VL
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<thead>
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<tr>
<td>Examination</td>
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<tr>
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<tr>
<td>Type of course</td>
<td>Course or seminar</td>
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<tr>
<td>SWS</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
<td>28 h</td>
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### inf697 - Current Topics in 'Business Informatics' IV

<table>
<thead>
<tr>
<th>Module label</th>
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<tr>
<td>Module abbreviation</td>
<td>inf697</td>
</tr>
<tr>
<td>Credit points</td>
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<td>Workload</td>
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#### Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

#### Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites
- No participant requirements

#### Skills to be acquired in this module

**Professional competences**

The students:

- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

**Methodological competences**

The students:

- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

**Social competences**

The students:

- communicate with users and experts convincing

**Self-competences**

The students:

- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

#### Module contents

See assigned course description

#### Recommended reading

As assigned in course

#### Links

- Language of instruction: German
- Duration (semesters): 1 Semester
- Module frequency: irregular
- Module capacity: unlimited
- Module level: Teaching/Learning method: 1S or 1VL
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<td>Final exam of module</td>
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<tr>
<td>Type of course</td>
<td>Course or seminar</td>
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<td>SWS</td>
<td>2</td>
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<tr>
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<td>SoSe oder WiSe</td>
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inf810 - Special Topics in Computer Science I

Module label: Special Topics in Computer Science I
Module abbreviation: inf810
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Computing Science (Master) > Informatik, allgemein
- Master's Programme Environmental Modelling (Master) > Mastermodule

Responsible persons:
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
No participant requirements

Skills to be acquired in this module:
This module integrates current computer science developments into the business informatics program by appropriate study courses.

Professional competence:
The students:
- know recent technological or scientific computer science developments
- transfer computer science methods and development models to IT application area requirements
- evaluate the possibilities and limitations of computer science methods and tools and apply them appropriately

Methodological competence:
The students:
- review problems, formulate them with formal models and explore them appropriately
- identify and present (one or more) computer science problem solutions
- select and evaluate appropriate tools and methods
- examine problems with technical and scientific literature

Social competence:
The students:
- work in a team

Self-competence:
The Students:
- plan their informatical actions independently

Module contents:
According to the assigned task

Recommended reading:
According to the assigned task

Language of instruction:
German

Duration (semesters):
1 Semester

Module frequency:
every semester

Module capacity:
unlimited

Module level:

Type of module:

Teaching/Learning method:
4 events from V, Ü, S, P, PR

Previous knowledge:
none

Examination:
Examination times
Type of examination:
Exercises or presentation or oral exam or written exam

Final exam of module:
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<th>Type of course</th>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
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inf811 - Special Topics in Computer Science II

<table>
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<th>Module label</th>
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<tr>
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<td>Workload</td>
<td>180 h</td>
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</table>
| Applicability of the module  | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik  
- Master's Programme Computing Science (Master) > Informatik, allgemein  
- Master's Programme Environmental Modelling (Master) > Mastermodule |
| Responsible persons          | - Marx Gómez, Jorge (module responsibility)  
- Fränzle, Martin Georg (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                | No participant requirements            |
| Skills to be acquired in this module | This module integrates current computer science developments into the business informatics program, especially considering the selected focus area, by appropriate study courses. |
| Professional competence      | The students:  
- know recent technological or scientific computer science developments  
- transfer computer science methods and development models to IT application area requirement  
- evaluate the possibilities and limitations of computer science methods and tools and apply them appropriately |
| Methodological competence    | The students:  
- review problems, formulate them with formal models and explore them appropriately  
- identify and present (one or more) computer science problem solutions  
- select and evaluate appropriate tools and methods  
- examine problems with technical and scientific literature |
| Social competence            | The students:  
- work in a team |
| Self-competence              | The Students:  
- plan their informatical actions independently |
<p>| Module contents              | According to the assigned task         |
| Recommended reading          | According to the assigned task         |
| Language of instruction      | German                                 |
| Duration (semesters)         | 1 Semester                             |
| Module frequency             | every semester                         |
| Module capacity              | unlimited                              |
| Module level                 |                                       |
| Type of module               |                                       |
| Teaching/Learning method     | 4 events from V, Ü, S, P, PR           |
| Previous knowledge           | none                                   |
| Examination                  | Examination times                      |
| Final exam of module         | Exercises or presentation or oral exam or written exam |</p>
<table>
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<tr>
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<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
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<tr>
<td>Module label</td>
<td>Current Topics in Computer Science I</td>
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<tr>
<td>--------------</td>
<td>--------------------------------------</td>
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<tr>
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<td>Workload</td>
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| Applicability of the module | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik  
- Master's Programme Computing Science (Master) > Informatik, allgemein  
- Master's Programme Environmental Modelling (Master) > Mastermodule |
| Responsible persons | - Marx Gómez, Jorge (module responsibility)  
- Fränzle, Martin Georg (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites | No participant requirements |
| Skills to be acquired in this module | This module integrates current computer science developments into the business informatics program by appropriate study courses.  
**Professional competence**  
The students:  
- know recent technological or scientific computer science developments  
- transfer computer science methods and development models to IT application area requirements  
- evaluate the possibilities and limitations of computer science methods and tools and apply them appropriately  
**Methodological competence**  
The students  
- review problems, formulate them with formal models and explore them appropriately  
- identify and present (one or more) computer science problem solutions  
- select and evaluate appropriate tools and methods  
- examine problems with technical and scientific literature  
**Social competence**  
The students:  
- work in a team  
**Self-competence:**  
The Students:  
- plan their informatical actions independently |
<p>| Module contents | According to the assigned task |
| Recommended reading | According to the assigned task |
| Links | |
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | every semester |
| Module capacity | unlimited |
| Module level | |
| Type of module | |
| Teaching/Learning method | 2 VA aus V, Ü, S, P, PR |
| Previous knowledge | none |
| Examination | Examination times | Type of examination |
| Final exam of module | Exercises or presentation or oral exam or written exam |
| Type of course | VA-Auswahl |</p>
<table>
<thead>
<tr>
<th>SWS</th>
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<tbody>
<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<tr>
<td>On-site workload</td>
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inf813 - Current Topics in Computer Science II

<table>
<thead>
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<th>Module label</th>
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<tbody>
<tr>
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<td>3.0 KP</td>
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<tr>
<td>Workload</td>
<td>90 h</td>
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</table>
| Applicability of the module           | • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik  
• Master's Programme Computing Science (Master) > Angewandte Informatik  
• Master's Programme Computing Science (Master) > Informatik, allgemein  
• Master's Programme Environmental Modelling (Master) > Mastermodule |
| Responsible persons                   | • Marx Gómez, Jorge (module responsibility)  
• Fränzle, Martin Georg (module responsibility)  
• Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                          | No participant requirements            |
| Skills to be acquired in this module  | This module integrates current computer science developments into the business informatics program, especially considering the selected focus area, by appropriate study courses. |
|                                       | **Professional competence**             |
|                                       | The students:                          |
|                                       | • know recent technological or scientific computer science developments  
• transfer computer science methods and development models to IT application area requirements  
• evaluate the possibilities and limitations of computer science methods and tools and apply them appropriately |
|                                       | **Methodological competenc**            |
|                                       | The students:                          |
|                                       | • review problems, formulate them with formal models and explore them appropriately  
• identify and present (one or more) computer science problem solutions  
• select and evaluate appropriate tools and methods  
• examine problems with technical and scientific literature |
<p>|                                       | <strong>Social competence</strong>                  |
|                                       | The students:                          |
|                                       | • work in a team                       |
|                                       | <strong>Self-competence:</strong>                   |
|                                       | The Students:                          |
|                                       | • plan their informatical actions independently |
| Module contents                       | According to the assigned task         |
| Recommended reading                   | According to the assigned task         |
| Language of instruction                | German                                 |
| Duration (semesters)                  | 1 Semester                             |
| Module frequency                      | every semester                         |
| Module capacity                       | unlimited                              |
| Module level                          | Type of module                         |
| Teaching/Learning method              | 2 events from V, Ü, S, P, PR            |
| Previous knowledge                    | none                                   |
| Examination                           | Examination times                      |
| Exercise                              | Exercises or presentation or oral exam or written exam |</p>
<table>
<thead>
<tr>
<th>Type of course</th>
<th>VA-Auswahl</th>
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<tbody>
<tr>
<td>SWS</td>
<td>2</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<tr>
<td>On-site workload</td>
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</table>
inf1202 - Advanced Practical Course ‘Data Science’

<table>
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<th>Module label</th>
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<tbody>
<tr>
<td>Module abbreviation</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
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<td>Applicability of the module</td>
<td>Master's Programme Business Informatics (Master) &gt; Akzentsetzungsmodule der Informatik</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Wingerath, Wolfram (module responsibility)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>Basics of Databases, Basics of Data Science</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>The goals of this module are to acquire practical knowledge of data science and to relate it to questions from a concrete application domain. Furthermore, the students gain a sustainable insight into the technical realization, implementation, and content classification of data analysis processes and their results.</td>
</tr>
<tr>
<td></td>
<td>Professional competences</td>
</tr>
<tr>
<td></td>
<td>The students</td>
</tr>
<tr>
<td></td>
<td>have knowledge of technical implementation and programming of data analysis processes</td>
</tr>
<tr>
<td></td>
<td>program and implement processes in the context of data analysis (such as for automation or data cleaning).</td>
</tr>
<tr>
<td></td>
<td>Methological competences</td>
</tr>
<tr>
<td></td>
<td>The students</td>
</tr>
<tr>
<td></td>
<td>propose concrete processing principles for specific questions</td>
</tr>
<tr>
<td></td>
<td>reflect on certain technologies and procedures with regard to their effects on the results of data analyses</td>
</tr>
<tr>
<td></td>
<td>Social competences</td>
</tr>
<tr>
<td></td>
<td>The students</td>
</tr>
<tr>
<td></td>
<td>generate approaches for data analysis in a team</td>
</tr>
<tr>
<td></td>
<td>Self competences</td>
</tr>
<tr>
<td></td>
<td>The students</td>
</tr>
<tr>
<td></td>
<td>recognize their resilience in implementation and recognize errors/results</td>
</tr>
<tr>
<td></td>
<td>reflect on their actions</td>
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<tr>
<td>Module contents</td>
<td>This module is primarily designed as a practical continuation of the module Data Science I. It deepens the content covered there through practical application in a concrete problem area. The module focuses on:</td>
</tr>
<tr>
<td></td>
<td>design of analyses to answer concrete questions from the given problem area</td>
</tr>
<tr>
<td></td>
<td>development (and cleaning) of relevant data sources</td>
</tr>
<tr>
<td></td>
<td>selection and application of appropriate concepts and techniques in conducting analyses</td>
</tr>
<tr>
<td></td>
<td>Interpretation and presentation of results</td>
</tr>
<tr>
<td>Recommended reading</td>
<td>See description of the assigned course</td>
</tr>
<tr>
<td>Languages of instruction</td>
<td>German, English</td>
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<td>Duration (semesters)</td>
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<td>Teaching/Learning method</td>
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<tr>
<td>Previous knowledge</td>
<td>Basics of Databases, Basics of Data Science</td>
</tr>
<tr>
<td>Examination</td>
<td>Examination times</td>
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<td>at the end of the lecture period or by arrangement with the instructor.</td>
</tr>
<tr>
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<td>Practical training</td>
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<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
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inf1204 - Special topics from the field of 'Data Science'

Module label | Special topics from the field of 'Data Science'
Module abbreviation | inf1204
Credit points | 6.0 KP
Workload | 180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Praktische Informatik

Responsible persons
- Wingerath, Wolfram (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Skills to be acquired in this module
The module aims to integrate specific developments in the specialization area of "Data Science" into the course of study in the appropriate course forms.

Professional competences
The students
- differentiate and contrast in more detail a subfield of computer science in which they have specialized or reflect on computer science in general
- recognize and evaluate the techniques and methods to be used in their area of specialization and their limitations
- identify, structure, and solve problems also in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods in investigating and solving problems, drawing on other disciplines as appropriate
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

Methodological competences
The students
- investigate problems using technical and scientific literature write an article according to scientific principles and present their results in a scientific talk
- reflect on problems, including those in new or emerging areas of their discipline, and apply computer science methods to investigate and solve them
- plan time schedules and other resources

Social competences
The students
- communicate persuasively orally and in writing with users and professionals

Self competences
The students
- critically follow further developments in computer science in general and in their special field
- develop and reflect on their own theories in relation to independently formulated hypotheses

Module contents
See description of the assigned course

Recommended reading
Will be announced in the course

Links

Language of instruction | German
Duration (semesters) | 1 Semester
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<tr>
<td>Type of module</td>
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</tr>
<tr>
<td>Teaching/Learning method</td>
<td>2 events from V, Ü, S, P</td>
</tr>
<tr>
<td>Previous knowledge</td>
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</tr>
<tr>
<td>Examination</td>
<td>Examination times</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>At the end of the lecture period or by arrangement with the instructor</td>
</tr>
<tr>
<td></td>
<td>Presentation or oral exam or portfolio or written exam</td>
</tr>
<tr>
<td>Type of course</td>
<td>VA-Auswahl</td>
</tr>
<tr>
<td>SWS</td>
<td>SoSe oder WiSe</td>
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# inf1206 - Hot topics from the field of 'Data Science' I

<table>
<thead>
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</thead>
<tbody>
<tr>
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<td>Credit points</td>
<td>3.0 KP</td>
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<tr>
<td>Workload</td>
<td>90 h</td>
</tr>
</tbody>
</table>
| Applicability of the module         | • Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik  
|                                     | • Master's Programme Computing Science (Master) > Praktische Informatik                      |
| Responsible persons                 | • Wingerath, Wolfram (module responsibility) 
|                                     | • Lehrenden, Die im Modul (authorised to take exams)                                        |
| Prerequisites                       | No participant requirements                 |
| Skills to be acquired in this module| The module aims to integrate current developments in the specialization area of "Data Science" into the course of study in the appropriate course forms |

### Professional competences

The students

- differentiate and contrast in more detail a subfield of the field of data science in which they have specialized or reflect on computer science in general
- recognize and evaluate the techniques and methods to be used in their area of specialization and their limitations
- identify, structure, and solve problems also in new or emerging areas of their discipline
- apply state-of-the-art and innovative methods in investigating and solving problems, drawing on other disciplines as appropriate
- recognize the limits of current knowledge and technology and contribute to the further scientific and technological development of computer science
- discuss current developments in computer science and assess their significance

### Methodological competences

The students

- investigate problems using technical and scientific literature write an article according to scientific principles and present their results in a scientific talk
- reflect on problems, including those in new or emerging areas of their discipline, and apply computer science methods to investigate and solve them
- plan time schedules and other resources

### Social competences

The students

- communicate persuasively orally and in writing with users and professionals

### Self competences

The students

- critically follow further developments in computer science in general and in their special field
- develop and reflect on their own theories in relation to independently formulated hypotheses

<table>
<thead>
<tr>
<th>Module contents</th>
<th>See description of the assigned course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended reading</td>
<td>Will be announced in the course</td>
</tr>
<tr>
<td>Links</td>
<td></td>
</tr>
<tr>
<td>Languages of instruction</td>
<td>German, English</td>
</tr>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td><strong>Module frequency</strong></td>
<td>irregular</td>
</tr>
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<td>-------------------------------</td>
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<tr>
<td><strong>Module capacity</strong></td>
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<tr>
<td><strong>Module level</strong></td>
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<tr>
<td><strong>Type of module</strong></td>
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</tr>
<tr>
<td><strong>Teaching/Learning method</strong></td>
<td>1V or 1 S</td>
</tr>
<tr>
<td><strong>Previous knowledge</strong></td>
<td>none</td>
</tr>
<tr>
<td><strong>Examination</strong></td>
<td>Examination times</td>
</tr>
<tr>
<td><strong>Final exam of module</strong></td>
<td>At the end of the lecture period or by arrangement with the instructor</td>
</tr>
<tr>
<td><strong>Type of course</strong></td>
<td>Course or seminar</td>
</tr>
<tr>
<td><strong>SWS</strong></td>
<td>2</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td>SoSe oder WiSe</td>
</tr>
<tr>
<td><strong>On-site workload</strong></td>
<td>28 h</td>
</tr>
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</table>
inf5400 - Advanced Topics in Applied Deep Learning

Module label: Advanced Topics in Applied Deep Learning
Module abbreviation: inf5400
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons:
- Strodthoff, Nils (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
This module is intended for an advanced audience and requires a solid understanding of the fundamentals of Machine Learning. Experience in training deep neural networks is essential in this context.

Skills to be acquired in this module:

Professional competence:
The students
- have in-depth knowledge of selected application areas of deep learning. They are familiar with various solutions for problems in these areas, know their advantages and disadvantages, and can practically implement them and adapt them to their own issues.

Methodological competence:
The students
- independently develop theoretical and practical concepts with the help of in-person events, provided materials, and specialized literature.

Social competence:
The students
- can present solution approaches for problems in this area to the plenary and defend them in discussions.

Self-competence:
The students
- are able to assess their own subject-specific and methodological competence. They take responsibility for their competence development and learning progress and reflect on these independently. In addition, they independently work on learning content and can critically reflect on the content.

Module contents:
This lecture builds upon the module "Applied Deep Learning in PyTorch" and addresses current research topics at an advanced level of depth. As in the first part, there is a strong emphasis on imparting practical knowledge, which will be learned and reinforced through practical exercises.

The thematic areas to be covered in various instantiations of the module include deep learning methods for time series analysis, self-supervised learning methods, and modern generative models.

Recommended reading

Links
Language of instruction: English
Duration (semesters): 1 Semester
Module frequency: Wintersemester
Module capacity: unlimited
### Module level

#### Type of module

**Teaching/Learning method**: 1VL + 1Ü

**Previous knowledge**: This module is intended for an advanced audience and requires a solid understanding of the fundamentals of Machine Learning. Experience in training deep neural networks is essential in this context.

### Examination

#### Examination times

<table>
<thead>
<tr>
<th>Type of examination</th>
<th>Final exam of module</th>
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<tbody>
<tr>
<td></td>
<td>At the end of the lecture period</td>
</tr>
<tr>
<td></td>
<td>Written exam / oral exam / project work</td>
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### Type of course

<table>
<thead>
<tr>
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<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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</thead>
<tbody>
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<td>WiSe</td>
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<tr>
<td>Exercises</td>
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<td>2</td>
<td>WiSe</td>
<td>0</td>
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**Total module attendance time**: 0 h
inf5402 - Trustworthy Machine Learning

<table>
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<tbody>
<tr>
<td>Module abbreviation</td>
<td>inf5402</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
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<td>Applicability of the module</td>
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</tr>
<tr>
<td></td>
<td>- Master's Programme Business Informatics (Master) &gt; Akzentsetzungsmodule der Informatik</td>
</tr>
<tr>
<td></td>
<td>- Master's Programme Computing Science (Master) &gt; Angewandte Informatik</td>
</tr>
<tr>
<td>Responsible persons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Strodthoff, Nils (module responsibility)</td>
</tr>
<tr>
<td></td>
<td>- Lehrenden, Die im Modul (authorised to take exams)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Content requirements are basic theoretical knowledge in machine learning, practical programming knowledge in Python basic knowledge in deep neural network training.</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
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</tr>
<tr>
<td>Professional competence</td>
<td></td>
</tr>
<tr>
<td>The students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- have an overview of the various aspects that determine the quality of machine learning algorithms.</td>
</tr>
<tr>
<td></td>
<td>- are familiar with methods to measure different quality aspects and, if necessary, methods to enhance them, and they can implement and apply these methods.</td>
</tr>
<tr>
<td>Methodological competence</td>
<td></td>
</tr>
<tr>
<td>The students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- independently develop theoretical and practical concepts with the help of in-person events, provided materials, and specialized literature.</td>
</tr>
<tr>
<td>Social competence</td>
<td></td>
</tr>
<tr>
<td>The students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- can present solution approaches for problems in this area to the plenary and defend them in discussions.</td>
</tr>
<tr>
<td>Self-competence</td>
<td></td>
</tr>
<tr>
<td>The students</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- are able to assess their own subject-specific and methodological competence. They take responsibility for their competence development and learning progress and reflect on these independently. In addition, they independently work on learning content and can critically reflect on the content.</td>
</tr>
<tr>
<td>Module contents</td>
<td></td>
</tr>
<tr>
<td>Machine learning algorithms are increasingly being applied in a wide range of areas, particularly in safety-critical domains. However, the quality of these algorithms is rarely systematically examined. The focus of this event is on various quality dimensions for machine learning algorithms, especially deep neural networks. This ranges from performance measurement to interpretability/explainability (XAI), robustness (adversarial robustness, non-adversarial robustness, distribution shifts, OOD-detection), uncertainty quantification, fairness/bias, and privacy. The methods will be introduced theoretically in the lecture and practically implemented and applied in the exercises.</td>
<td></td>
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</table>

Recommended reading

Links

Language of instruction English
Duration (semesters) 1 Semester
Module frequency Wintersemester
Module capacity unlimited
Module level
Type of module
<table>
<thead>
<tr>
<th>Teaching/Learning method</th>
<th>1VL + 1Ü</th>
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<tbody>
<tr>
<td>Previous knowledge</td>
<td>Content requirements are basic theoretical knowledge in machine learning, practical programming knowledge in Python basic knowledge in deep neural network training.</td>
</tr>
<tr>
<td>Examination</td>
<td>Examination times</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>At the end of the lecture term</td>
</tr>
<tr>
<td>Type of course</td>
<td>Comment</td>
</tr>
<tr>
<td>Lecture</td>
<td></td>
</tr>
<tr>
<td>Exercises</td>
<td></td>
</tr>
<tr>
<td>Total module attendance time</td>
<td></td>
</tr>
</tbody>
</table>
inf5408 - Applied Deep Learning in PyTorch

Module label | Applied Deep Learning in PyTorch
Module abbreviation | inf5408
Credit points | 6.0 KP
Workload | 180 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering
- Master's Programme Environmental Modelling (Master) > Mastermodule

Responsible persons
- Strodthoff, Nils (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- Knowledge of fundamental theoretical understanding in the field of machine learning and practical programming skills in Python.

Skills to be acquired in this module

Professional competence
The students
- have an overview of the components of deep learning frameworks
- are familiar with application areas of deep learning methods across various data modalities, and common solution strategies and model architectures
- can appropriately adapt deep learning methods to new problems in the respective domains and apply them independently.

Methodological competence
The students
- independently develop theoretical and practical concepts with the help of in-person events, provided materials, and specialized literature.

Social competence
The students
- can present solution approaches for problems in this area to the plenary and defend them in discussions.

Self-competence
The students
- are able to assess their own subject-specific and methodological competence
- take responsibility for their competence development and learning progress and reflect on these independently
- independently work on learning content and can critically reflect on the content.

Module contents

This lecture provides a comprehensive introduction to contemporary Deep Learning methods, with a specific emphasis on their practical application. Concurrently, it serves as a primer for the widely-used PyTorch Deep Learning framework, assuming only a basic familiarity with Python. The course encompasses a wide range of prevalent machine learning tasks across various data types, including tabular, image, text, audio, and graph data. Throughout the course, we delve into the most crucial and up-to-date model architectures within these domains.

This encompasses convolutional neural networks, recurrent neural networks,
and transformer models. The lecture is complemented by hands-on exercise sessions, where students will gain practical proficiency with PyTorch. Simultaneously, they will acquire practical insights to effectively apply contemporary deep learning methods within their specific fields of interest.

### Recommended reading

**Links**

<table>
<thead>
<tr>
<th>Language of instruction</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration (semesters)</td>
<td>1 Semester</td>
</tr>
<tr>
<td>Module frequency</td>
<td>every winter term</td>
</tr>
<tr>
<td>Module capacity</td>
<td>unlimited</td>
</tr>
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**Module level**

<table>
<thead>
<tr>
<th>Type of module</th>
<th>1VL + 1Ü</th>
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<tbody>
<tr>
<td>Previous knowledge</td>
<td>knowledge of fundamental theoretical understanding in the field of machine learning and practical programming skills in Python.</td>
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**Examination**

<table>
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<tr>
<th>Final exam of module</th>
<th>at the end of the lecture period</th>
<th>Written / oral exam</th>
</tr>
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<tbody>
<tr>
<td><strong>Type of course</strong></td>
<td><strong>Comment</strong></td>
<td><strong>SWS</strong></td>
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<tr>
<td>Lecture</td>
<td></td>
<td>2</td>
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<tr>
<td>Exercises</td>
<td></td>
<td>2</td>
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</table>

**Total module attendance time**

0 h
inf5450 - Current topics in applied deep learning

<table>
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<th>Current topics in applied deep learning</th>
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</thead>
<tbody>
<tr>
<td>Module abbreviation</td>
<td>inf5450</td>
</tr>
<tr>
<td>Credit points</td>
<td>3.0 KP</td>
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<tr>
<td>Workload</td>
<td>90 h</td>
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<td>Applicability of the module</td>
<td>• Master's Programme Business Informatics (Master) &gt; Akzentsetzungsmodule der Informatik • Master's Programme Computing Science (Master) &gt; Angewandte Informatik</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>• Strodthoff, Nils (module responsibility) • Lehrenden, Die im Modul (authorised to take exams)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>The seminar requires attending a foundational lecture in the field of Machine Learning and Deep Learning.</td>
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</tbody>
</table>

Skills to be acquired in this module

- **Professional competence**
  The students have an overview of selected current challenges in the field of applied deep learning, along with exemplary solution approaches, and can contextualize the latter within the broader methodological context.

- **Methodological competence**
  The students can independently explore topics using current research literature and critically reflect upon them.

- **Social competence**
  The students can present solution approaches for problems in this area to the plenary and defend them in discussions.

- **Self-competence**
  The students are able to assess their own subject-specific and methodological competence. They take responsibility for their competence development and learning progress and reflect on these independently. In addition, they independently work on learning content and can critically reflect on the content.

Module contents

This seminar provides insights into selected methodological challenges in the field of applied deep learning. Depending on the instantiation of the module, different emphases will be placed, such as the modeling of long-range interactions or methods for improving the label efficiency of machine learning algorithms, e.g. through self-supervised learning.

Recommended reading

Links

Language of instruction | English |
Duration (semesters) | 1 Semester |
Module frequency | every winter term |
Module capacity | unlimited |
Module level | |
Type of module | |
Teaching/Learning method | 1S |
Previous knowledge | The seminar requires attending a foundational lecture in the field of Machine Learning and Deep Learning. |
Examination | Examination times | Type of examination |
<table>
<thead>
<tr>
<th>Examination</th>
<th>Examination times</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>at the end of the lecture period/intermediate exams</td>
<td>oral exam / portfolio / presentation</td>
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<table>
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<tr>
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<th>Seminar</th>
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<tbody>
<tr>
<td>SWS</td>
<td>2</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<tr>
<td>On-site workload</td>
<td>28 h</td>
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</table>
Inf5452 - Current Topics in Trustworthy Machine Learning

Module label
Current Topics in Trustworthy Machine Learning

Module abbreviation
inf5452

Credit points
3.0 KP

Workload
90 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

Responsible persons
- Strodthoff, Nils (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
- The seminar requires attending a foundational lecture in the field of Machine Learning and/or Deep Learning.

Skills to be acquired in this module

Professional competence
The students
- gain an exemplary overview of challenges and existing solution approaches in their respective problem domains and can contextualize these within the broader methodological context.

Methodological competence
The students
- can independently explore topics using current research literature and critically reflect upon them.

Social competence
The students
- can present solution approaches for problems in this area to the plenary and defend them in discussions.

Self-competence
The students
- are able to assess their own subject-specific and methodological competence. They take responsibility for their competence development and learning progress and reflect on these independently. In addition, they independently work on learning content and can critically reflect on the content.

Module contents
This seminar provides insights into various aspects of trustworthy Machine Learning. Depending on the instantiation of the module, different focuses should be set, such as interpretability/explainability, uncertainty quantification, or robustness.

Recommended reading

Links

Language of instruction
English

Duration (semesters)
1 Semester

Module frequency
every winter term

Module capacity
unlimited
<table>
<thead>
<tr>
<th>Module level</th>
<th>Type of module</th>
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<tbody>
<tr>
<td>Teaching/Learning method</td>
<td>1S</td>
</tr>
<tr>
<td>Previous knowledge</td>
<td>Basic lecture in the field of machine learning, deep learning Prior knowledge desirable.</td>
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<table>
<thead>
<tr>
<th>Examination</th>
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<th>Type of examination</th>
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<tbody>
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<td>Final exam of module</td>
<td>at the end of the lecture period/intermediate exams</td>
<td>oral exam / portfolio / presentation</td>
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<tr>
<th>Type of course</th>
<th>Seminar</th>
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</thead>
</table>

| SWS | 2 |
| Frequency | WiSe |
| On-site workload | 28 h |
Module der Wirtschafts- und Rechtswissenschaften (Master)

wir032 - Managerial Accounting

Module label: Managerial Accounting
Module abbreviation: wir032
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Bachelor's Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Economics and Business Administration (Bachelor) > Basismodule
- Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Basismodule
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

Responsible persons:
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:
- Skills to be acquired in this module:
This course is an introduction to the use of accounting information by managers for decision-making, planning and control. It is designed to equip students with the concepts and techniques of management accounting for identifying and resolving strategic issues faced by managers in various business contexts.

Module contents:
See leading textbook

Recommended reading:
Seal et al., Management Accounting, Mcgraw-Hill Education Ltd, 5. Edition

Links:
http://www.uni-oldenburg.de/accounting/

Language of instruction:
English

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
unlimited

Reference text:
Vorlesung auf Englisch

Module level:

Type of module:

Teaching/Learning method:

Previous knowledge:

Examination:
Examination times
Type of examination

Final exam of module:
end of term
written exam

Type of course:
Comment
SWS
Frequency
Workload of compulsory attendance

Lecture:
2

Tutorial:
2

Total module attendance time:
56 h
wir041 - Introduction to economics

Module label: Introduction to economics
Module abbreviation: wir041
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module
- Bachelor's Programme Business Administration and Law (Bachelor) > Basiscurriculum Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Comparative and European Law (Bachelor) > Module
- Bachelor's Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Economics and Business Administration (Bachelor) > Basismodule
- Bachelor's Programme Mathematics (Bachelor) > Nebenfachmodule
- Bachelor's Programme Sustainability Economics (Bachelor) > Grundlagen-/Basiscurriculum
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Basismodule
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

Responsible persons
- Rahmeier Seyffarth, Anelise (Module counselling)
- Böhringer, Christoph (module responsibility)

Prerequisites
None

Skills to be acquired in this module
Students: acquire a basic understanding of economics
- know elementary economic terms and theories
- learn to analyze economic problems graphically and/or mathematically
- are able to grasp both micro- and macroeconomic relationships based on theory
- understand basic economic models and are able to apply them to current economic problems
- place current economic and political events and debates in economic contexts
- understand under which conditions market interventions by policy makers are justified from an economic perspective
- are able to assess possible effects of economic policy instruments (for example: taxes, subsidies, minimum and maximum prices, etc.).

Module contents
The course introduces students to economic thinking and gives an elementary overview of the fundamental themes in economics. Key causal relationships will be verbally, analytically and graphically elucidated and underpinned with real-world examples. Main contents:
- Introduction to economic thinking
- Explanation of basic concepts of economic theory
- Economic cycle and national product
- Interdependence and trade
- Functioning and efficiency of markets
- Market failures and government activity
- Firms behavior in markets with diverse structures
- Foundations of game theory

Recommended reading
- The CORE Team: The Economy (free, open access text for introductory undergraduate courses; continuous updates), URL: https://www.core-econ.org
The module consists of lectures and tutorials. The contents of the course will be taught in the lecture. The tutorial sessions are aimed at solving problem sets or exercises to deepen students' understanding. Lecture notes and other relevant materials will be uploaded to the learning management system (Stud.IP).

<table>
<thead>
<tr>
<th>Type of module</th>
<th>Examination times</th>
<th>Type of examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final exam of module</td>
<td>end of semester</td>
<td>written exam; voluntary contributions that improve grades may undertaken as 'portfolio-presentations' during tutorials</td>
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<table>
<thead>
<tr>
<th>Type of course</th>
<th>Comment</th>
<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<td>Tutorial</td>
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<td>56 h</td>
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**wir060 - Financial Accounting**

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<tbody>
<tr>
<td>Module abbreviation</td>
<td>wir060</td>
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<tr>
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<td>6.0 KP</td>
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<tr>
<td>Workload</td>
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**Applicability of the module**
- Bachelor’s Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften
- Bachelor’s Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor’s Programme Economics and Business Administration (Bachelor) > Aufbaumodule
- Bachelor’s Programme Mathematics (Bachelor) > Nebenfachmodule
- Bachelor’s Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor’s Programme Economics and Business Administration (Bachelor) > Aufbaumodule
- Master’s Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
none

**Skills to be acquired in this module**
The students
- obtain knowledge on IFRS accounting in general and specific topics such as financial instruments, intangible assets and provisions;
- understand the framework of IFRS;
- understand the international focus and necessity of IFRS;
- obtain knowledge on IFRS from both a legal and economic perspective.

**Module contents**
This module is based on accounting and annual financial statement, while focusing exclusively on the international financial reporting standards (IFRS). In terms of content, the course covers subjects such as the most important concepts, tangible and intangible assets as well as liability items on the basis of the fundamental standards and case studies.

**Recommended reading**
International Financial Reporting Standards (IFRS)
Lecture notes with additional references will be provided via the e-learning platform Stud.IP.

**Links**
http://www.uni-oldenburg.de/accounting/

**Language of instruction**
English

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Reference text**
Lectures are held in English; tutorials are held in English or German.

**Module level**

**Type of module**

**Teaching/Learning method**

**Previous knowledge**

**Examination**

<table>
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<tr>
<th>Examination</th>
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<th>Type of examination</th>
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<tbody>
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<td>written exam</td>
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**Type of course**

<table>
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**Total module attendance time**
56 h
## wir070 - Principles of Marketing

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<td>Module abbreviation</td>
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### Applicability of the module
- Bachelor's Programme Business Administration and Law (Bachelor) > Basiscurriculum Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Comparative and European Law (Bachelor) > Module
- Bachelor's Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Economics and Business Administration (Bachelor) > Aufbaumodule
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Aufbaumodule
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

### Responsible persons
- Alavi, Sascha (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
- keine

### Skills to be acquired in this module
Upon completion of the module, students will be able to:
- recognize and provide solutions to challenges in market-oriented business management
- reflect on market-oriented business management with regard to practise, as well as related societal and ethical implications
- actively participate in scholarly marketing discourse
- build their own capacities to acquire knowledge and skills within the discipline

### Module contents
The module focuses on the fundamentals of marketing in the sense of market-orientated management by linking philosophy and theoretical connections, as well as the necessary analytical and methodical knowledge with concrete case studies.

### Recommended reading

### Links
- www.uni-oldenburg.de/marketing

### Language of instruction
- German

### Duration (semesters)
- 1 Semester

### Module frequency
- jährlich

### Module capacity
- unlimited

### Module level
- Teaching/Learning method
- Previous knowledge

### Examination/Learning method
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**Total module attendance time**

56 h
wir090 - Human Resource Management

Module label | Human Resource Management
Module abbreviation | wir090
Credit points | 6.0 KP
Workload | 180 h

Applicability of the module

- Bachelor's Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Comparative and European Law (Bachelor) > Module
- Bachelor's Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Economics and Business Administration (Bachelor) > Akzentsetzungsmodule
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Schwerpunkt Management und Ökonomie
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

Responsible persons

- Junker-Michel, Mareike (Module counselling)
- Breisig, Thomas (Module counselling)
- Lehrenden, Die im Modul (authorised to take exams)
- Breisig, Thomas (module responsibility)

Prerequisites

keine

Skills to be acquired in this module

Upon completion of the module (two complementary lectures), students will be able to:

- understand the complex issues, challenges and fields of action in organisational Human Resource (HR) Management;
- analyse, interpret and manage HR issues within heterogeneous fields of stakeholders and environments;
- effectively analyse and apply HR instruments according to the specific practical context;
- develop skills to self-reflection by dealing with theoretical as well as practical issues in HR Management and are able to press their point within the scientific discussion;
- are able to locate a specific research question within the scientific discussion in the field of Human Resource Management and to interlink, reflect and evaluate it accordingly.

By attending the non-compulsory tutorials and participating in lecture discussions, students can develop their own position on the inter-linkages between theoretical approaches and practical courses of action. Students will thus be able to identify problems, analyse them critically, and develop solutions. As they have the opportunity to work in small groups within the tutorials and to participate during lecture discussions, students may also learn to handle different points of view and discuss constructively. Overall they will be prepared for the specific requirements faced in the field of HR Management.

Module contents

Students develop theoretical as well as practical insights into the backgrounds and specific characteristics of "Human Resource" Management, in particular the following:
- origins and theoretical basis
- development and framework requirements
- workforce planning
- recruitment and selection
- work organisation
- working time organisation
- leadership
- performance reviews

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- training and development
- compensation
- staff reduction

Recommended reading

Further literature will be announced during the semester according to the particular lecture/seminar content.

Links
www.uol.de/orgpers

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
jährlich

Module capacity
unlimited

Module level

Type of module

Teaching/Learning method

Previous knowledge

Examination
Examination times
Type of examination

Final exam of module
At the end of the lecture period and at the end of the semester
written exam

Type of course
Comment
SWS
Frequency
Workload of compulsory attendance

Lecture
freiwillig
4
56

Exercises
2
WiSe
28

Total module attendance time
84 h
**Module label**: Corporate Finance  
**Module abbreviation**: wir082  
**Credit points**: 6.0 KP  
**Workload**: 180 h  

### Applicability of the module
- Bachelor's Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften  
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften  
- Bachelor's Programme Economics and Business Administration (Bachelor) > Akzentsetzungsmodule  
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich  
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Schwerpunkt Management und Ökonomie  
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master) > Mastermodule  
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)  
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen

### Responsible persons
- Prokop, Jörg (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
- Students  
- Lehrenden, Die im Modul (authorised to take exams)

### Skills to be acquired in this module
- understand the role corporate finance plays in today's business environment,  
- are able to make consistent investment decisions based on established financial models both under uncertainty and under uncertainty,  
- are able to place these models in within the broader context of economic theory, including both neoclassical theory and principal-agent theory,  
- are able to assess the limitations of these models,  
- analyze firm's main sources of (long-term) financing.

### Module contents
**Course outline:**
1. Introduction  
2. Valuation and Capital Budgeting  
3. Risk and Return  
4. Long-Term Financing  

This course is an introduction to corporate finance. It covers typical tools and techniques used in making investment and financing decisions, and it provides insights into their theoretical foundations. The concept of time value of money and net present value is discussed in detail, first under certainty, and then in the presence of uncertainty. We will examine the relationship between an investment’s risk and its return, and discuss ways to derive risk-adjusted cost of equity capital. In addition, the course provides insights into firms’ main sources of (long-term) financing.

The topics covered in this course are relevant for financial decision-making in various areas of business management, including operations management, marketing, and in particular corporate strategy.

### Recommended reading
**Main textbook:** Hillier, Ross, Westerfield, Jaffe & Jordan, Corporate Finance, current edition, McGraw-Hill (especially chapters 1, 2, 4-10, 14).  

### Links
[http://www.uni-oldenburg.de/fiwi_bbl/](http://www.uni-oldenburg.de/fiwi_bbl/)

**Language of instruction**: English  
**Duration (semesters)**: 1 Semester
### Module frequency
jahrgänglich

### Module capacity
unbegrenzt

### Module level

### Type of module

### Teaching/Learning method

### Previous knowledge

### Examination / Learning method

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### Type of course

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<td>Tutorial</td>
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### Total module attendance time
56 h
**wir100 - Corporate Strategy**

**Module label**: Corporate Strategy

**Module abbreviation**: wir100

**Credit points**: 6.0 KP

**Workload**: 180 h

**Applicability of the module**
- Bachelor's Programme Business Administration and Law (Bachelor) > Aufbaumodul: Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich: Wirtschaftswissenschaften
- Bachelor's Programme Economics and Business Administration (Bachelor) > Studiengang: Betriebswirtschaftslehre
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Aufbaumeister der Wirtschaftswissenschaften
- Bachelor's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**
- Lehrende, Die im Modul (authorised to take exams)
- Hoppmann, Jörn (module responsibility)

**Prerequisites**

**Skills to be acquired in this module**
The goal of the course is that students are able to:
- know and understand basic concepts, instruments, and theories of strategic management
- analyze company strategies by applying conceptual frameworks
- understand the advantages and disadvantages of common instruments and models and critically evaluate their applicability
- independently develop strategic options and derive recommendations for their implementation in real-life settings

**Module contents**
The course offers a comprehensive overview of the models and instruments of strategic management. The first part of the course introduces important concept and models of strategic management and discusses their application using examples from corporate practice. Central topics that are being discussed in this context are the relation between firm strategies and competitive advantage, strategy analysis, strategy formulation, strategy implementation, and strategies in the context of internationalization and innovation. In the second part of the course, students apply and deepen their knowledge by writing a thesis that analyzes the strategy of a specific company.

**Recommended reading**

**Links**

**Language of instruction**: German

**Duration (semesters)**: 1 Semester

**Module frequency**: jährlich

**Module capacity**: unlimited

**Module level**:

**Type of module**

**Teaching/Learning method**

**Previous knowledge**

**Final exam of module**

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**Total module attendance time**: 56 h
### wir130 - Civil Law and Commercial Law

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**Applicability of the module**

- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Economics and Business Administration (Bachelor) > Akzentsetzungsmodule
- Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Schwerpunkt Berufliche Bildung
- Dual-Subject Bachelor's Programme Economics and Business Administration (Bachelor) > Schwerpunkt Management und Ökonomie
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**

- Rott, Peter (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Skills to be acquired in this module**

- are familiar with the legal working methods, basic concepts of law in general and of civil law and commercial law in particular,
- are familiar with the law of obligation and law of property, in particular with contract law, as well as with commercial law, which are the main fields of interest in the future professional practice,
- are able to solve legal cases in a goal-oriented way,
- are able to find approaches for legal problems as well as recognize liability risks and how to deal with them,
- are in case of contract negotiations able to recognize the requirements for regulations and to evaluate consequences of regulation.

**Module contents**

In this module students will learn the basic concepts of civil law, commercial law and company law. The main focus are the first two books and to some extent the third book of the BGB. After an introduction to the legal system and the legal sources of private law, the course will deal with the persons and objects of legal relations (legal subjects and objects). An introduction into general contract law (among others: transaction doctrine, representation, termination of obligations, arrears, defaults) follows then. Subsequently, the lecture will handle the main types of contracts of civil law, commitment and performance of transactions and ownership and possession. The focus of the commercial law will be the determination of traits of merchandiser, the company law, the commercial register and legal liability issues as well as cross-border trade. This is followed by an introduction into company law.

Subjects of the module: Introduction into legal studies, basic principles of law, private law / public law, legal sources, general part of the civil code, law of obligations (without law of torts); contracts, type of contracts, defaults / breaches, law of terms and conditions; parts of property law. Traits of merchandiser, company; commercial register; Representation in commercial law (procuration, action and charging power of attorney); commercial transactions; forms and consequences of the change of the owner; commercial agents and brokers; customary law / trade terms; CISG; partnership / corporate law.

The module will enable students to evaluate complex legal relationships in the economy discretely.

**Recommended reading**


**Links**

http://www.privatrecht.uni-oldenburg.de/

**Language of instruction**

German

**Duration (semesters)**

2 Semester

**Module frequency**

jährlich

**Module capacity**

unlimited

**Module level**

Type of module

Teaching/Learning method

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<table>
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<tr>
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<td>Exercises</td>
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**Total module attendance time** 84 h
The module introduces to the basics of Entrepreneurship. Upon completion of the module, students will be able to:
- understand the challenges of launching an enterprise,
- strategically analyse the structure of market,
- understand how employees are able to behave like an entrepreneur in established enterprises,
- develop innovative business ideas,
- shape the key factors for realizing a business idea,
- demonstrate a knowledge of the entrepreneurial process,
- demonstrate a knowledge of cost accounting (especially break-even analysis, etc.) and will be able to calculate costs by themselves,
- analyse and evaluate business models.

The module combines the lecture “Strategie und Entrepreneurship” with a tutorial. It investigates the challenges of launching enterprises and entrepreneurial behaviour in large companies as well. The content of the module follows the process of an entrepreneur. It starts with business ideas, their perception, and evaluation. In addition, it deals with the most important questions of development and management of new business models. The contents of the courses include the following topics:

- historical, institutional, and theoretical context
- development, evaluation, and pitching ideas
- business models
- building entrepreneurial teams
- entrepreneurship in large enterprises
- resources and finance
- management of growth

Recommended reading:

**Links**
http://www.uni-oldenburg.de/wire/entrepreneurship/lehrangebot/veranstaltungen/lehrangebot-wise-20162017/

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<td>The lecture “Strategie und Entrepreneurship” must be attended in combination with the “Tutorium”.</td>
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**Module level**

**Type of module**

**Teaching/Learning method**

**Previous knowledge**

**Examination**

<table>
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**Final exam of module**

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**Total module attendance time**

56 h
Principles of Organisation

**Module label**: Principles of Organisation

**Module abbreviation**: wir200

**Credit points**: 6.0 KP

**Workload**: 180 h

**Applicability of the module**
- Bachelor’s Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften
- Bachelor’s Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor’s Programme Business Informatics (Bachelor) > Wahlfächer Informatik, Kultur und Gesellschaft
- Bachelor’s Programme Computing Science (Bachelor) > Wahlfächer Informatik, Kultur und Gesellschaft
- Bachelor’s Programme Economics and Business Administration (Bachelor) > Studienrichtung Betriebswirtschaftslehre
- Bachelor’s Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule
- Master’s Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**
- Lehrende, Die im Modul (authorised to take exams)
- Bartel, Teodora (Module counselling)
- Breisig, Thomas (Module counselling)
- Prokop, Jörg (module responsibility)
- Breisig, Thomas (module responsibility)

**Prerequisites**
- Keine

**Skills to be acquired in this module**
Upon completion of the module, students will be able to:
- explain and apply the approaches and instruments of organisational sciences;
- demonstrate a familiarity with the basic assumptions, strategies, and core themes of organisational theories and are able to compare and reflect upon them;
- know different forms of organisational design and are able to differentiate them;
- know how to identify and predict issues and developments within operational and organisational structures and processes;
- demonstrate an awareness of the relevance of organisational culture, can describe its characteristics and discuss different analytical techniques;
- describe and analyse processes of organizational change, can point out their influences on strategy, organisational culture, operational and organisational structure, and estimate the relevance of change process initiation;
- work cooperatively and self-dependant within teams and to present complex professional contents precisely and with profound arguments (if chosen to present a topic within the seminar).

Furthermore, the students are able:
- to locate a specific research question within the scientific discussion in this research area and to interlink, reflect and evaluate it accordingly;
- to press their point within the scientific discussion in this research area.

**Module contents**
The module contents are arranged in the following way:
- Basic concepts and conceptual demarcation
- Objectives of an organisation
- Dimensions in formal organisation
- Organisational culture
- Organisational structure
- Operational structure and processes

These basic principles of organisation are presented and discussed within the lectures. Current economic and business developments are included. Seminars and tutorials are offered to deepen the lecture presentations and to relate them to examples and cases.

**Recommended reading**

**Links**
www.uol.de/orgpers

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Module level**
---

**Type of module**
je nach Studiengang Pflicht oder Wahlpflicht

**Teaching/Learning method**

**Previous knowledge**
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**wir210 - Corporate Environmental Management**

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**Applicability of the module**
- Bachelor’s Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften
- Bachelor’s Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor’s Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor’s Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Betriebswirtschaftslehre more...
- Bachelor’s Programme Economics and Business Administration (Bachelor) > Studienrichtung Ökologie und Nachhaltigkeit
- Bachelor’s Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule
- Master’s Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master’s Programme Computing Science (Master) > Module aus anderen Studiengängen

**Responsible persons**
- Siebenhüner, Bernd (module responsibility)
- Lehrenden, Die im Modul (Module counselling)

**Prerequisites**
- Siebenhüner, Bernd (module responsibility)
- Lehrenden, Die im Modul (Module counselling)

**Skills to be acquired in this module**
- The students:
  - understand the goals and concepts of sustainable development;
  - discuss the importance of sustainability for companies;
  - know basic strategies and instruments that enable companies to achieve sustainable development;
  - acquire conceptual and practical skills using case studies, in particular about which instruments can be used to prepare companies for the challenges of sustainable development.

**Module contents**
The module consists of a lecture and a seminar. While the lecture presents and explains concepts, instruments and strategies for sustainable development, the seminar focuses on the practical relevance of the various instruments, concepts and strategies and discusses these based on case studies.
- Concepts and goals of sustainable development
- Introduction to the current discussion on sustainable development
- Current sustainability instruments and strategies for companies
- Case studies

**Recommended reading**

**Links**
- https://www.uni-oldenburg.de/wire/

**Language of instruction**
- German

**Duration (semesters)**
- 1 Semester

**Module frequency**
- jährlich

**Module capacity**
- unlimited
Module level

Type of module

Teaching/Learning method

Previous knowledge

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Total module attendance time 56 h
**wir260 - Environmental Economics**

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<td>Workload</td>
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**Applicability of the module**

- Bachelor's Programme Business Informatics (Bachelor) > Akzentsetzungsbereich Wirtschaftswissenschaften
- Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Ökologie und Nachhaltigkeit
- Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Volkswirtschaftslehre
- Bachelor's Programme Sustainability Economics (Bachelor) > Vertiefungsmodul
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**

- Lehrenden, Die im Modul (authorised to take exams)
- Huse, Cristian (module responsibility)

**Prerequisites**

- The undergraduates
- understand the basic subjects of environmental economics
- know essentials of economic theory in environmental policy
- know environmental problems and are able to analyze and interpret them economically
- know the mechanics of instruments in environmental policy and also their conditions of usage
- are able to evaluate instruments of environmental policy
- know about the problems of transnational environmental burdens
- know methods of environmental assessment

**Module contents**

- Following topics will be discussed:
  - definition and differentiation of environmental economics
  - economic interpretations of environmental problems
  - objectives and instruments of environmental policy
  - market economy instruments of environmental policy
  - conditions of implementation of environmental politics
  - International environmental problems
  - environmental assessment

**Recommended reading**


**Links**

- [https://www.uni-oldenburg.de/wire/](https://www.uni-oldenburg.de/wire/)

**Language of instruction**

- German

**Duration (semesters)**

- 1 Semester

**Module capacity**

- unlimited

**Module level**

**Type of module**

- Lecture

**Previous knowledge**

**Examination**

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**Type of course**

- Lecture

**SWS**

- 4

**Frequency**

**On-site workload**

- 56 h
wir400 - Strategic and International Marketing

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| Applicability of the module   | • Bachelor's Programme Business Administration and Law (Bachelor) > Aufbaubereich Wirtschaftswissenschaften  
                                 • Bachelor's Programme Business Informatics (Bachelor) > Akzentsatzungsbereich Wirtschaftswissenschaften  
                                 • Bachelor's Programme Economics and Business Administration (Bachelor) > Studienrichtung Betriebswirtschaftslehre  
                                 • Bachelor's Programme Sustainability Economics (Bachelor) > Wahlpflichtbereich  
                                 • Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule  
                                 • Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master) |
| Responsible persons           | • Alavi, Sascha (module responsibility)  
                                 • Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                  |                                         |
| Skills to be acquired in this module | Upon completion of the module, students will be able to: |
|                               | • recognize challenges facing marketing strategy in the field of markets and societies and draw conclusions for business management  
                                 • elaborate and reflect upon the theoretical and conceptual foundations of strategic marketing planning  
                                 • come up with examples that exemplify the systemic connection between strategic and instrumental marketing planning  
                                 • discuss core assumptions of internationalization in the context of strategy planning and critically reflect upon its implications  
                                 • build market research skills in an international context using different methods  
                                 • develop their own perspectives on the conceptualization and implementation of international marketing strategies and advance them in discourses |
| Module contents               | The core of the module is the application of strategic planning methods in Marketing. A broadened understanding of Marketing in the areas of competitors, market agents and stakeholder orientation will be substantiated in theoretical and practical-normative view. International marketing forms an integrated part of strategic marketing planning; its basics and internal conception are formulated precisely in this course. |
| Recommended reading           | Latest editions of Meffert, H., Marketing-Management, Analyse - Strategie - Implementierung, Wiesbaden  
                                 Kreikebaum H., Strategische Unternehmensplanung, Stuttgart/ Berlin/ Köln  
                                 Benkenstein, M., Strategisches Marketing, Stuttgart/ Berlin/ Köln |
<p>| Links                         | <a href="http://www.uni-oldenburg.de/marketing">www.uni-oldenburg.de/marketing</a>           |
| Language of instruction       | German                                  |
| Duration (semesters)          | 1 Semester                              |
| Module frequency              | jährlich                                 |
| Module capacity               | unlimited                               |
| Module level                  |                                         |
| Type of module                |                                         |
| Teaching/Learning method      |                                         |
| Previous knowledge            |                                         |
| Examination                   | Examination times                       | Type of examination |
| Final exam of module          | end of term                             | written exam; voluntary contributions that improve grades may undertaken as 'portfolio-presentations' during tutorials |</p>
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Module label: Concepts of Organisation and Management
Module abbreviation: wir801
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master's programme Business Administration: Management and Law (Master) > Basismodule
- Master's programme Business Administration: Management and Law (Master) > Kernmodule CHI
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Management Consulting (Master) > Mastermodule

Responsible persons:
- Breisig, Thomas (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)
- Wengelowski, Peter (Module counselling)
- Gilbert, Jonathan (Module counselling)
- Breisig, Thomas (Module counselling)

Prerequisites:
- keine

Skills to be acquired in this module:
Students get to know selected concepts of organisation and management. Their respective objectives, instruments and methods are discussed and their use in everyday business is critically reflected. Students learn to deal with different management concepts in a conscious and critical way, especially through case studies and discussions.

Upon completion of the module, students will:
- be familiar with the emergence, development, and content of various management concepts;
- be able to convey key findings of the various management concepts to practical issues in the field of organisation and management;
- develop skills of self-reflection (supported by the technical and didactical concepts).

Module contents:
Students receive deeper insights into concepts of organisation and management, including:
- Lean Management
- Change Management
- Quality Management
- Business Process Reengineering

The presentations and discussions within the seminars also offer possibilities to deepen and broaden these topics according to the student’s interest and current developments in theory and practice, e.g. Balanced Scorecard, Learning Organisation, Organisational Culture, Worker Participation, Networks, Diversity Management, Management by Objectives.

Recommended reading:

Further literature will be announced during the semester according to the particular lecture/seminar content.

Links:
www.uol.de/orgpers

Language of instruction:
German

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
unlimited

Reference text:
Das Modul muss im Masterstudiengang Wirtschafts- und Rechtswissenschaften als Basismodul von allen Schwerpunkten gewählt werden.
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<td>Seminar paper or presentation or written exam or oral exam or portfolio or project report (will be determined and announced at the beginning of the semester by the lecturer)</td>
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### Module label
Information Technology Law

### Module abbreviation
wir806

### Credit points
6.0 KP

### Workload
180 h

### Applicability of the module
- Bachelor's Programme Business Informatics (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Bachelor's Programme Computing Science (Bachelor) > Wahlbereich Informatik, Kultur und Gesellschaft
- Master Applied Economics and Data Science (Master) > Specialization
- Master of Education Programme (Gymnasium) Computing Science (Master of Education) > Pflichtmodule
- Master of Education Programme (Hauptschule and Realschule) Computing Science (Master of Education) > Recht und Gesellschaft
- Master's programme Business Administration: Management and Law (Master) > Basismodule
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - Recht
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen

### Responsible persons
- Rott, Peter (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)
- Rott, Peter (Module counselling)

### Prerequisites
not applicable

### Skills to be acquired in this module
The students are familiar with the effects of digitalisation with its chances and risks in European and German private law and, in particular, consumer law. They obtain knowledge of specific areas of digitalised private law and consumer law with particular relevance for their future professional practice, are able to solve consumer law cases in a goal-oriented way, are able to find approaches for legal problems as well as recognise liability risks and how to deal with them, and are, in contract negotiations, able to recognise the requirements for regulation and to evaluate its consequences.

### Module contents
This module conveys how new technologies impact on private law and, in particular, on consumer law. It focuses on the (modified) interpretation of existing laws but even more on the reactions of the EU and national legislators and of the judiciary to new technological developments. The module discusses, among others, distance selling law, digitalised sales law and product liability law, the law of digital content and digital services, unfair commercial practices on internet and the law of the platform economy. Finally, the module looks at enforcement.

### Recommended reading
to be announced in the first lecture

### Links
German

### Language of instruction
1 Semester

### Duration (semesters)
jährlich

### Module frequency
unlimited

### Module capacity
MM (Mastermodul / Master module)

### Type of module
Wahlpflicht / Elective

### Teaching/Learning method
Lecture and Seminar

### Previous knowledge
basic knowledge of civil law is helpful.

### Examination
Examination times
to be taken from the examination regulations

### Type of examination

### Final exam of module
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### wir808 - Multivariate Statistics

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**Applicability of the module**
- Master's programme Business Administration: Management and Law (Master) > Basismodule
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules

**Responsible persons**
- Stecking, Ralf Werner (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

**Skills to be acquired in this module**

With successful completion of the course, students shall:

- be aware of and be able to evaluate advanced methods of multivariate data analysis.
- be able to select adequate methods in relevant fields of application, like prediction, classification, and segmentation analysis.
- be able to run computer-aided analyses and to interpret the results properly.

**Module contents**

Various methods of quantitative data analysis such as:

- Linear Regression,
- Logistic Regression,
- Linear Discriminant Analysis,
- Principal Component Analysis,
- Feature selection and evaluation methods.

**Recommended reading**


**Links**

- Language of instruction: German
- Duration (semesters): 1 Semester
- Module frequency: jährlich
- Module capacity: unlimited
- Module level
- Type of module
- Teaching/Learning method
- Previous knowledge

**Examination**

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142 / 223
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wir812 - Environmental Law

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**Applicability of the module**
- Master's programme Business Administration: Management and Law (Master) > Basismodule
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-Recht
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - Recht
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen
- Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules

**Responsible persons**
- Meyerholt, Ulrich (Module counselling)
- Godt, Christine (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
- Building on the existing knowledge of the participants, the course will deepen knowledge of European and international law, whereby emphasis will be laid on those areas in which the dividing line between state intervention (public law) and market rights (private law) has become blurred.
- Students will be able to analyze contemporary regulatory techniques inherent in the multilevel system of governance and to assess them from an interdisciplinary (economic and legal) perspective.

**Module contents**
The module comprises two courses, one of which will be taught by PD Dr. Meyerholt, and the other together with Prof. Godt.
- The first course deals with selected issues in environmental law. With the general structure of environmental law as a point of departure, the course content will be taught in a holistic manner that will also incorporate the leading decisions of the higher courts.
- The second course takes into consideration intra-disciplinary environmental law as situated between public and private economic law, whereby special focus will be laid on the European and international dimensions.

**Recommended reading**

**Language of instruction**
- German

**Duration (semesters)**
- 1 Semester

**Module frequency**
- jährlich

**Module capacity**
- unlimited

**Module level**

**Type of module**
- Teaching/Learning method

**Previous knowledge**
- Examination
  - Examination times: during term
  - Type of examination: oral presentation and written script

**Type of course**
- Lecture

**SWS**
- 4

**Frequency**
- SoSe oder WiSe

**On-site workload**
- 56 h
wir814 - Strategic Management

Module label | Strategic Management
Module abbreviation | wir814
Credit points | 6.0 KP
Workload | 180 h

Applicability of the module
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen

Responsible persons
- Hoppmann, Jörn (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
Keine

Skills to be acquired in this module
- Know advanced theoretical concepts, research streams, and frameworks of in the field of Strategic Management
- Understand the links between different theories and are able to critically question them
- Can apply theories to understand and interpret organizational dynamics in daily life
- Are able to develop solutions for concrete practical challenges in companies in the context of Strategic Management based on the concepts and frameworks they have learned
- Can put the newly acquired knowledge into a broader context, so it can be deepened in the further professional life

Module contents
The course offers an overview of advanced concepts and frameworks in the field of Strategic Management. At the beginning, the course will provide a brief introduction into the historical development, goals, and research streams of the field. In this context, important terms, methods, and philosophical approaches of (management) research will be clarified. Subsequently, students form groups to analyze selected scientific articles with regard to their theoretical relevance and practical implications. Theoretical topics that will be covered in depth are:
1. Top Management Teams, Upper Echelons and Corporate Governance
2. Resource- and Capability-based Approaches
4. Institutional Theory, Institutional Work/Entrepreneurship and Social Movements
5. Organizational Cognition, Identity, and Framing
6. Organizational Learning and Ambidexterity
7. Organizational networks and ecosystems
The results of the analysis will be summarized in a seminar thesis, presented in class, and discussed with the other students. The main goal of the course is to equip students with advanced concepts, which allow them to understand organizational dynamics, question established practices in firms, and develop new solutions that go beyond the application of standard instruments.

Recommended reading

<table>
<thead>
<tr>
<th>Links</th>
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<th>Type of module</th>
<th>Teaching/Learning method</th>
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</table>
In today's highly dynamic business environment, innovation is the key to the success of most firms. Moreover, technological and organizational innovations represent valuable instruments for achieving progress toward sustainable development. Against this background, this module familiarizes students with the tools and processes for managing innovation and for developing overall more innovative firms. The module comprises a lecture and a seminar. In the lecture, students become acquainted with the drivers to and role of innovation; they learn about designing innovative firms and developing innovation strategies; they get to know the different sources of innovation; they familiarize themselves with the methods for choosing between alternative planned innovations; they learn how innovation is implemented; and they understand how innovation benefits are exploited. The accompanying seminar is supposed to familiarize the students with select advanced topics surrounding the management of innovation. Moreover, the students train their skills in working in teams, in working with scientific literature, in academic writing, and in presenting in front of a large audience.

Module contents
Organizational change, creative destruction, ambidexterity, exploration, exploitation, absorptive capacity, sustainability transitions, innovation models, innovation networks, innovation strategy, innovation ecosystems, diffusion of innovations, organizational routines, entrepreneurship, new ventures, etc.

Recommended reading

Links
This module is offered in the winter term. For a more detailed description of course content and organization, please note the syllabus that will be made available via Stud.IP before the beginning of the course.
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<td>56 h</td>
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</table>
wir842 - Banking

Module label: Banking
Module abbreviation: wir842
Credit points: 6.0 KP
Workload: 180 h

Applicability of the module:
- Master Applied Economics and Data Science (Master) > Specialization
- Master of Education Programme (Vocational and Business Education) Economics and Business Administration (Master of Education) > Mastermodule
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule AFT - BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

Responsible persons:
- Prokop, Jörg (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites:

Skills to be acquired in this module:
Upon completion of the module students will be able to explain the role financial institutions play in financial markets based on economic theory. They will have a sound knowledge of institutional and regulatory conditions under which financial institutions operate today, and they will be able to critically assess respective developments in the financial sector. Moreover, they will have developed a sound understanding of how banks are managed in a competitive environment.

Module contents:
We will discuss theoretical foundations of financial intermediation in general, and of banking in particular as well as the economic, institutional, and regulatory context in which financial institutions operate today. Moreover, we will cover selected topics in the area of bank management and bank accounting.

Recommended reading:
- Berger / Molyneux / Wilson (Eds.): The Oxford Handbook of Banking, latest edition, Oxford University Press
- Tolkmitt: Neue Bankbetriebslehre, latest edition, Gabler

Further readings may be announced during the course.

Links:
http://www.uni-oldenburg.de/fiwi_bbl/

Languages of instruction:
German, English

Duration (semesters):
1 Semester

Module frequency:
jährlich

Module capacity:
unlimited

Module level:

Type of module:

Teaching/Learning method:

Previous knowledge:

Examination Examination times Type of examination
Final exam of module typically at the end of the semester; potential mid-term examination dates will be announced in the first session 1 term paper (Hausarbeit) or 1 written exam (Klausur) or 1 oral exam (mündliche Prüfung) or 1 Portfolio

Type of course:
Lecture

SWS:
4

Frequency:

On-site workload:
56 h
Basic theories of Organisation and Human Resources

**Module label:** Basic theories of Organisation and Human Resources

**Module abbreviation:** wir848

**Credit points:** 6.0 KP

**Workload:** 180 h

**Applicability of the module:**
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons:**
- Gilbert, Jonathan (Module counselling)
- Breisig, Thomas (authorised to take exams)
- Gilbert, Jonathan (authorised to take exams)
- Breisig, Thomas (module responsibility)

**Skills to be acquired in this module:**
Students get to know central theories of organisation and human resources (HR). They are empowered to apply theories in order to explain practical phenomena and to solve practical problems. The ability to put on different "theory glasses" while observing and analysing various organisational and HR practices is fostered. Students learn to deal with different theories in a conscious and critical way, especially through case studies, group work and discussions.

Upon completion of the module, students will:
- be able to explain various classic and modern theories of organisation and human resource theories, differentiate them and reflect them critically;
- be able to apply the theoretical and abstract ways of thinking and perception so as to transfer them on operational decisions;
- develop skills of self-reflection (supported by the technical and didactical concepts).

**Module contents:**
Students receive deeper insights into classical and modern theories of organisation and human resource, including:
- Weber's theory of bureaucracy
- Taylor's principles of Scientific Management
- Human Relations approach
- Behavioural decision theory
- Situational approach
- Micro-political approaches
- New Institutional Economics
- Theories of motivation
- Theories of leadership

The presentations and discussions within the seminars also offer possibilities to deepen and broaden these topics according to the student's interest and latest developments in theory and practice.

**Recommended reading:**

Further literature will be announced during the semester according to the particular lecture/seminar content.

**Links:**
www.uol.de/orgpers

**Language of instruction:** German

**Duration (semesters):** 1 Semester

**Module frequency:** jährlich

**Module capacity:** unlimited

**Reference text:** Die Veranstaltung ist im Master Wirtschafts- und Rechtswissenschaften in den Schwerpunkten ManECo und FUGO verwendbar.

**Module level:** 150 / 223
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<td>Type of examination</td>
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<td>Depending on the type of examination during the lecture period, at the end of the lecture period or at the end of the semester</td>
<td>Seminar paper or presentation or written exam or oral exam or portfolio or project report (will be determined and announced at the beginning of the semester by the lecturer)</td>
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**Total module attendance time** 56 h
### wir857 - Law of Media and Telecommunication

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| Applicability of the module   | • Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - Recht  
• Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - Recht  
• Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)  
• Master's Programme Computing Science (Master) > Module aus anderen Studiengängen |
| Responsible persons           | • Boehme-Neßler, Volker (module responsibility)  
• Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                 |                                   |
| Skills to be acquired in this module | The students:  
• have in-depth insights into the economic conditions of media production, distribution and exploitation.  
• know the legal basis and framework conditions of media production, media presentation and mediation (e.g. copyrights, performance rights, distribution of media).  
• bring together economic and legal dimensions of media work.  
• know the economic and legal framework conditions of media institutions (e.g. television, radio, media mediation). |
| Module contents               | This module is about making a connection of the theoretical and practical acquired aesthetic competences with the economic and legal framework conditions. In the sense of professionalisation, prospective media producers and mediators should learn to assess their own future activities under economic and legal conditions. |
| Recommended reading           | Current case law and:  
Fechner, Medienrecht, 19.Aufl. 2018  
Petersen, Medienrecht, 2010. |
| Links                         | http://www.integrated-media.de/ |
| Language of instruction       | German                            |
| Duration (semesters)          | 1 Semester                        |
| Module frequency              | jährlich                          |
| Module capacity               | unlimited                         |
| Module level                  |                                   |
| Type of module                |                                   |
| Teaching/Learning method      |                                   |
| Previous knowledge            |                                   |

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wir860 - Data Protection Law

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**Applicability of the module**
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - Recht
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - Recht
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen

**Responsible persons**
- Lehrenden, Die im Modul (authorised to take exams)
- Rott, Peter (module responsibility)

**Prerequisites**

**Skills to be acquired in this module**
Upon completion of the module, students will be able to:
- recognize simple data protection incidents.
- apply existing protection mechanisms.
- implement projects in accordance with the law.
- discuss and defend their plans in front of others.

**Module contents**
The module gives an overview on data protection laws. Basic knowledge of data protection regulations (DSGVO; BDSG) and existing protection mechanisms is imparted. Within the framework of the seminar, the discussed topics will be deepened with the help of seminar papers and individual aspects will be discussed in more detail. The event will highlight the new informational structures in modern society and their effects on data protection and data security. Questions concerning general personal rights, freedom of information, IT security and relevant criminal law regulations will be discussed on the basis of examples and legally provided protection mechanisms as well as the tasks of supervisory authorities will be discussed. In particular, the most important decisions on data protection will be covered in detail during the seminar. At the seminar, students will have the opportunity to prepare in-depth seminar papers on the various topics, which will then be discussed with all participants.

**Recommended reading**
Kühling/Klar/Sackmann, Datenschutzrecht, 2018.
Further literature references will be given in the lecture.

**Links**
http://www.wto.org/

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Module level**

**Type of module**

**Teaching/Learning method**

**Previous knowledge**

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<td>Final exam of module</td>
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<td>Seminar paper and presentation or Term paper or Oral exam</td>
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**Type of course**

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**Total module attendance time**
56 h
### Module Information

**Module label**: Forecasting Methods  
**Module abbreviation**: wir875  
**Credit points**: 6.0 KP  
**Workload**: 180 h

#### Applicability of the Module
- Master Applied Economics and Data Science (Master) > Empirical Methods
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - VWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen

#### Responsible Persons
- Stecking, Ralf Werner (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites
**Skills to be acquired in this module**
- Be aware of and be able to evaluate quantitative forecasting methods.
- Be able to select adequate methods in relevant fields of application, like time series and classification analysis.
- Be able to run computer-aided analyses and to interpret the results properly.

#### Module Contents
Various aspects of quantitative forecasting methods such as:
- Time series components,
- Trend and seasonal methods,
- Stationarity,
- Multivariate forecasting methods,
- Autoregressive and moving average processes,
- Box-Jenkins method.

#### Recommended Reading

#### Links
**Language of instruction**: English  
**Duration (semesters)**: 1 Semester  
**Module frequency**: halbjährlich  
**Module capacity**: unlimited  
**Module level**:
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<td>Previous knowledge</td>
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<tr>
<td>Examination</td>
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<tr>
<td>Examination times</td>
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<tr>
<td>Final exam of module</td>
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<tr>
<td>Examination times</td>
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<td>Final exam of module</td>
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<td>Examination times</td>
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<tr>
<td>Type of examination</td>
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<th>SWS</th>
<th>Frequency</th>
<th>Workload of compulsory attendance</th>
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<td>Exercises</td>
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**Total module attendance time**

56 h
# wir885 - Operations and Supply Chain Management

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<td>Credit points</td>
<td>6.0 KP</td>
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<td>Applicability of the module</td>
<td>Master's Programme Business Informatics (Master) &gt; Module der Wirtschafts- und Rechtswissenschaften (Master)</td>
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<td>Responsible persons</td>
<td>Busse, Christian (module responsibility)</td>
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<tr>
<td></td>
<td>Lehrenden, Die im Modul (authorised to take exams)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td></td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>The lecture pertaining to the module focuses on the development and critical discussion of formal analytical models for modelling and optimizing problems in operations and supply chain management. The aim is to provide students with the skills they need to analyze value-added processes in reality and not only to understand them, but ideally also improve them. The accompanying seminar, held in English, serves to deepen and critically examine the topics from the lecture. Supplementary to the lecture, the seminar deals with conceptual and empirical research and cases. Hereby, students get to know scientific discourses on practically relevant issues that are difficult to model. Furthermore, there will be ample training in scientific work, in team work and in presentations in front of large groups.</td>
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<tr>
<td>Module contents</td>
<td>Introduction to Operations Management; Demand Forecasting; Location Planning; Process Design; Inventory Management; Production Planning; Scheduling; Supply Chain Management; Revenue Management; Behavioral Operations Management</td>
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<td>Languages of instruction</td>
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<td>Duration (semesters)</td>
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<tr>
<td>Reference text</td>
<td>The module takes place in the winter semester. Please refer to the syllabus available via Stud.IP for a more detailed description of content and procedure.</td>
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<tr>
<td>Examination</td>
<td>Examination times</td>
</tr>
<tr>
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<td>Type of examination</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Portfolio, likely consisting of short test and short presentation</td>
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<td>Type of course</td>
<td>Comment</td>
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<td>SWS</td>
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### wir902 - International Sustainability Management

<table>
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#### Applicability of the module
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's programme Social Sciences (Master) > Wahlpflichtmodule anderer Institute und Departments
- Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules
- Master's Programme Water and Coastal Management (Master) > Socioeconomics

#### Responsible persons
- Siebenhüner, Bernd (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)
- Wegner, Alkje (authorised to take exams)
- Sievers-Glotzbach, Stefanie (authorised to take exams)

#### Prerequisites
- No

#### Skills to be acquired in this module
- Knowledge on the basic concepts and strategies of sustainability management related to corporate practice:
  - Sustainability: Basic concepts, strategies,
  - Domestic and international challenges for business,
  - Business case for sustainable development,
  - Integrative concepts of sustainable corporations,
  - Sustainable strategies,
  - Management instruments
- Discussing topics of international sustainability management with students from different scientific disciplines.
- Ability to present and evaluate different concepts and instruments of international sustainability management

#### Module contents
This module consists of a one lecture and one seminar (2 weekly contact hours per lecture/seminar) dealing with basic concepts and strategies of sustainability management within corporations. Both, lecture and seminar give an overview of current sustainability strategies for companies and present a variety of instruments to integrate and initiate sustainable development within corporations. While the lecture focuses more on theoretical approaches and introduces basic concepts of corporate sustainability management, the seminar provides a variety of case studies and business cases to demonstrate different concepts and instruments of sustainability management. The seminar provides the possibilities for inter- and transdisciplinary exchange and discussions.

#### Recommended reading
- BMU/BDI (Eds.) 2002: Sustainability Management in Business Enterprises. CSM, University of Lueneburg (Schaltegger, Herzig, Kleiber, Müller), http://www2.leuphana.de/umanagement/csm/content/nama/downloads/pdf-dateien/nmu_fs_engl_final.pdf
- Charter, Martin/Tischner, Ursula (Eds.) (2001): Sustainable Solutions, Developing Products and Services for the Future, Sheffield: Greenleaf; Board on Sustainable Development of the National Research Council, 1999

#### Links

#### Language of instruction
- English
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<td>Examination times</td>
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**wir904 - Environmental and Sustainability Policies**

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Computing Science (Master) > Module aus anderen Studiengängen
- Master's programme Social Sciences (Master) > Wahlpflichtmodule anderer Institute und Departments
- Master's Programme Sustainability Economics and Management (Master) > Basic and Accentuation Modules

**Responsible persons**
- Lehrenden, Die im Modul (authorised to take exams)
- Siebenhüner, Bernd (Module counselling)
- Wegner, Alkje (Module counselling)
- Müller, Werner Joachim (Module counselling)
- Siebenhüner, Bernd (module responsibility)

**Skills to be acquired in this module**
- have basic information about national and european environmental and sustainability governance
- describe the history of national and european environmental and sustainability governance
- reflect upon central principles, instruments, players and strategies in environmental and sustainability governance
- analyze selected topics of environmental and sustainability governance based upon central principles, instruments, players and strategies

**Module contents**
- Introduction to environmental politics - Politics, Political Science, Policy Analysis
- Environment – Terms and Concepts - Historical Foundations of Environmental Politics
- Actors, institutions and governance structures; Actors in Environmental Policy
- Socio-ecological systems framework
- Environmental Policy in Germany
- Environmental Policy in the European Union
- Steering and principles in environmental policy
- Instruments in environmental policy
- Policy process and environmental policy
- Multilevel and reflexive governance - Multilevel governance
- International environmental governance
- Science-Policy Interface

**Recommended reading**
- Aden, Hartmut (2012): Umweltpolitik, Wiesbaden: VS-Verlag

**Links**
- https://www.uni-oldenburg.de/wire/

**Languages of instruction**
- German, English

**Duration (semesters)**
- 1 Semester

**Module frequency**
- halbjährlich

**Module capacity**
- unlimited

**Module level**
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wir909 - Strategic Sustainability Management

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Applicability of the module
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

Responsible persons
- Hoppmann, Jörn (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Skills to be acquired in this module
The students should...
- know and understand basic concepts, instruments and theories in the context of corporate sustainability and corporate social responsibility
- be able to apply conceptual frameworks to analyze and critically question the sustainability of companies
- develop options to improve the sustainability of companies and derive recommendations for their implementation in practice

Module contents
The module "Strategic Sustainability Management" provides an overview of the debates on the role of firms for sustainable development from a strategic perspective. The first session will briefly introduce the historical debate on Corporate Sustainability and Corporate Social Responsibility and delineate important concepts. The following sessions will use concrete company case studies as a basis for a critical discussion of questions in the context of corporate sustainability that are of strategic importance for firms. Questions that will be discussed are, amongst others
- How can one determine whether a firm acts in a socially and ecologically sustainable way?
- Which factors drive and hinder the diffusion of socially and ecologically superior solutions and companies in the market?
- To which extent is there a conflict between firm and market growth on the one hand and sustainability on the other hand?
- Which possibilities does a company have to deal with conflicts between social/ ecological and economic goals?
- How can existing firms and value chains be transformed toward sustainability?
- What is the role of managers and boards of directors for organizational change toward sustainability?
- How does the ownership and financial structure of firms influence their strategy toward sustainability?
- In how far can cooperation and partnerships between organizations help integrate social and ecological aspects in firms?

In addition to discussing these questions by drawing on company case studies, students will be introduced to the corresponding theoretical concepts and frameworks in the academic literature. Also, students will be given the opportunity to test different strategies for implementing sustainability in organizations during a simulation, which allows them to gain first-hand insights into the emerging challenges. Toward the end of the course, students will apply and deepen the knowledge they have gathered over the semester by writing a seminar thesis.

Recommended reading
Aguinis, H., & Glavas, A. (2012): What we know and don’t know about corporate social


**Links**

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<td>This module is offered in the summer term. For a more detailed description of course content and organization, please note the syllabus that will be made available via Stud.IP before the beginning of the course.</td>
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**Total module attendance time** 56 h
# wir898 - Strategic Sustainability Management

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## Applicability of the module
- Master Applied Economics and Data Science (Master) > Specialization
- Master's programme Business Administration: Management and Law (Master) > Kernmodule CHI
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM-BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)
- Master's Programme Sustainability Economics and Management (Master) > Akzentmodule

## Responsible persons
- Hoppmann, Jörn (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)
- Hoppmann, Jörn (Module counselling)

## Prerequisites
- The students should...
  - know and understand basic concepts, instruments and theories in the context of corporate sustainability and corporate social responsibility
  - be able to apply conceptual frameworks to analyze and critically question the sustainability of companies
  - develop options to improve the sustainability of companies and derive recommendations for their implementation in practice

## Module contents
The module "Strategic Sustainability Management" provides an overview of the debates on the role of firms for sustainable development from a strategic perspective. The first session will briefly introduce the historical debate on Corporate Sustainability and Corporate Social Responsibility and delineate important concepts. The following sessions will use concrete company case studies as a basis for a critical discussion of questions in the context of corporate sustainability that are of strategic importance for firms. Questions that will be discussed are, amongst others:

- How can one determine whether a firm acts in a socially and ecologically sustainable way?
- Which factors drive and hinder the diffusion of socially and ecologically superior solutions and companies in the market?
- To which extent is there a conflict between firm and market growth on the one hand and sustainability on the other hand?
- Which possibilities does a company have to deal with conflicts between social/ecological and economic goals?
- How can existing firms and value chains be transformed toward sustainability?
- What is the role of managers and boards of directors for organizational change toward sustainability?
- How does the ownership and financial structure of firms influence their strategy toward sustainability?
- In how far can cooperation and partnerships between organizations help integrate social and ecological aspects in 53 firms?

In addition to discussing these questions by drawing on company case studies, students will be introduced to the corresponding theoretical concepts and frameworks in the academic literature. Also, students will be given the opportunity to test different strategies for implementing sustainability in organizations during a simulation, which allows them to gain first-hand insights into the emerging challenges. Toward the end of the course, students will apply and deepen the knowledge they have gathered over the semester by writing a seminar thesis.

## Recommended reading

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- Language of instruction: German, English
- Duration (semesters): 1 Semester
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**wir896 - Operations Management**

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**Applicability of the module**
- Master Applied Economics and Data Science (Master) > Specialization
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

**Responsible persons**
- Busse, Christian (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

**Skills to be acquired in this module**

**Module contents**
Die Vorlesung behandelt voraussichtlich folgende Themen: Nachfrageprognose, Prozessmanagement, Produktionsplanung, Ablaufplanung, Revenue Management, Behavioral Operations Management

**Recommended reading**


**Links**
https://www.uni-oldenburg.de/produktion

**Language of instruction**
English

**Duration (semesters)**
1 Semester

**Module frequency**
jährlich

**Module capacity**
unlimited

**Module level**

**Type of module**

**Teaching/Learning method**

**Previous knowledge**

**Examination**

**Final exam of module**

**Type of course**

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| Seminar | 2 | SoSe oder WiSe | 28 |

**Total module attendance time**
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### wir899 - Supply Chain Management

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#### Applicability of the module
- Master Applied Economics and Data Science (Master) > Specialization
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule RdW - BWL
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule UF - BWL
- Master's Programme Business Informatics (Master) > Module der Wirtschafts- und Rechtswissenschaften (Master)

#### Responsible persons
- Busse, Christian (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites

#### Skills to be acquired in this module
In der zum Modul gehörenden Vorlesung werden vor allem formalanalytische Modelle erarbeitet, mit denen Probleme in Wertschöpfungsketten beschrieben und im Rahmen der Modellannahmen optimiert werden können. Hiermit sollen die Studierenden eine Kompetenz zur unternehmensübergreifenden Analyse der gesamten Wertschöpfungskette (Supply Chain) erwerben, mit Hilfe derer sie diese nicht nur verstehen, sondern idealerweise auch verbessern können. Im begleitenden Seminar werden mithilfe von in Gruppen verfassten Hausarbeiten aktuelle Fragestellungen und Diskussionen im Supply Chain Management aufgearbeitet und bewertet. Das Seminar baut ergänzend zur Vorlesung auf konzeptioneller und empirischer Forschung auf. Hiermit lernen die Studierenden wissenschaftliche Diskurse zu praktisch relevanten und nur schwer modellierbaren Herausforderungen des Supply Chain Managements kennen. Ferner werden die Fähigkeiten zum wissenschaftlichen Arbeiten, zur Teamarbeit und zum Präsentieren vor großen Gruppen trainiert.

#### Module contents
Die Vorlesung behandelt voraussichtlich folgende Themen: Grundlagen der Supply Chain, Strategischer Fit, Netzwerk- und Standortplanung, Bestandsmanagement, Produkt- und Prozessdesign, Supply-Chain-Koordination, Vertragsdesign, Transport in der Supply Chain, Nachhaltiges Supply Chain Management

#### Recommended reading

#### Links
- https://www.uni-oldenburg.de/produktion

#### Language of instruction
English

#### Duration (semesters)
1 Semester

#### Module frequency
jährlich

#### Module capacity
unlimited

#### Module level

#### Type of module

#### Teaching/Learning method

#### Previous knowledge

#### Examination
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**Total module attendance time**

56 h
## Kernmodule

### inf900 - Group Project

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#### Applicability of the module
- Master's Programme Business Informatics (Master) > Kernmodule
- Master's Programme Computing Science (Master) > Kernmodule
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

#### Responsible persons
- Peter, Andreas (module responsibility)
- Marx Gómez, Jorge (module responsibility)
- Boll-Westermann, Susanne (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

#### Prerequisites
- Programming course
- Software Engineering
- Soft Skills

#### Skills to be acquired in this module
The students get familiar with different software development aspects in a team. Apart from software engineering knowledge and skills they develop key competences like project management, teamwork, problem solving competence and conflict management. Additionally, students develop special knowledge, skills and competences from the project group topic.

**Professional competence**
The students:
- characterise and apply computer science basics (algorithms, data structures, programming, basics of practical, technical and theoretical computer science)
- define and describe essential mathematical, logical and physical basics of computer science
- define and illustrate the core disciplines of computer science (theoretical, practical and technical computer science)

**Methodological competence**
The students:
- examine problems, use formal methods to phrase and analyze them appropriately
- evaluate problems by the use of technical and scientific literature
- reflect on a scientific topic and write a scientific seminar paper under guidance and present their findings

**Social competence**
The students:
- integrate criticism into their own actions
- respect team decisions
- communicate with users and experts convincingly

**Self-competence**
The students:
- take on project management tasks
- pursue the overall and special computer science development critically
- implement innovative professional activities effectively and independently
- recognise their abilities and extend them purposefully
- reflect their self-perception and actions with regard to professional, methodological and social aspects
- develop and reflect self-developed hypotheses to theories independently
- work in their field independently

#### Module contents
Cooperative development of a large-scale computer science project. This project general includes the (further) development of a hard or software system.

#### Recommended reading
According to the assigned task
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<td></td>
<td>- Soft Skills</td>
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<td>Final exam of module</td>
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<td>Type of course</td>
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inf903 - Research Project I

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Kernmodule
- Master's Programme Computing Science (Master) > Kernmodule
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Peter, Andreas (module responsibility)
- Boll-Westermann, Susanne (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirement

**Skills to be acquired in this module**
The Module practices the scientific competencies in preparation of the master thesis. It is intended to replace the project group with the two "Research Project" modules to ensure studyability and to enable students to perform research projects at foreign universities. Additionally, it is also intended to embed the student into the research activities of the supervisor in preparation of a potential doctoral work after finishing the program.

**Module contents**
Definition of a research question, identifying the state of the art, development of a research plan, performing research tasks, scientific writing, presentation of results.

**Professional competence**
The students:
- will extend their competences in the required technologies of the research area

**Methodological competence**
The students:
- will extend their competences in scientific methodologies, methods, and tools regarding the research area

**Social competence**
The students:
- will be integrated in the working group of the supervisor of the work and have to present as well as discuss the results within the working group

**Self-competence:**
The students:
- recognise their abilities and extend them purposefully
- reflect their self-perception and actions with regard to professional, methodological and social aspects:
- develop and reflect self-developed hypothesis to theories independently
- work in their field independently

**Recommended reading**
Will be announced by the supervisor according to the research topic.

**Languages of instruction**
English, German

**Duration (semesters)**
1 Semester

**Module frequency**
every semester

**Module capacity**
unlimited

**Module level**

**Type of module**

**Teaching/Learning method**
P

**Previous knowledge**
none

**Examination**

**Final exam of module**
At the end of the lecture period
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<td>Skills to be acquired in this module</td>
<td>The Module improves the scientific competencies in preparation of the master thesis. It is intended to replace the project group with the two “Research Project” modules to ensure studibility and to enable students to perform research projects at foreign universities. Additionally, it is also intended to embed the student into the research activities of the supervisor in preparation of a potential doctoral work after finishing the program.</td>
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<td>Methodological competence</td>
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<td>The students:</td>
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<td>• will improve their competences in scientific methodologies, methods, and tools regarding the research area.</td>
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<td>Social competence</td>
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<td>Self-competence:</td>
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<td>The students:</td>
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<td>• know their abilities and extend them purposefully</td>
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<td>• reflect their self-perception and actions with regard to professional, methodological and social aspects</td>
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<td>• develop and reflect self-developed hypothesis to theories independently</td>
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<td>• work in their field independently</td>
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<td>Definition of a research question, identifying the state of the art, development of a research plan, performing research tasks, scientific writing, presentation of results</td>
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<td>SWS</td>
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<tr>
<td>Frequency</td>
<td>WiSe</td>
</tr>
<tr>
<td>On-site workload</td>
<td>56 h</td>
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mam - Master Thesis Module Business Informatics

<table>
<thead>
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<tbody>
<tr>
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<td>Master's Programme Business Informatics (Master) &gt; Kernmodule</td>
</tr>
<tr>
<td>Responsible persons</td>
<td>Hein, Andreas (module responsibility)</td>
</tr>
<tr>
<td></td>
<td>Marx Gómez, Jorge (module responsibility)</td>
</tr>
<tr>
<td></td>
<td>der Informatik, Lehrende (authorised to take exams)</td>
</tr>
<tr>
<td>Prerequisites</td>
<td>no participant requirements</td>
</tr>
<tr>
<td>Skills to be acquired in this module</td>
<td>By completing the master's thesis, the student provides evidence that he/she is able to process and solve complex and holistic tasks in computer science on the basis of comprehensive scientific knowledge and by applying the scientific method apparatus. In particular, the student has brought the technical and methodological knowledge acquired during the master's program as well as his/her technical and social competence into the processing of the master's thesis and applied them successfully. The master's seminar serves to discuss the content and methodology of the master's thesis. At the same time, it serves as an exchange of scientific and practical experience and enables the students to reflect on different approaches to solutions on the basis of theoretical knowledge and experience. The master seminar ends with a colloquium on the master thesis.</td>
</tr>
<tr>
<td>Module contents</td>
<td>Corresponding topic from business informatics</td>
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<tr>
<td>Recommended reading</td>
<td>Will be specified according to the concrete topic</td>
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<tr>
<td>Language of instruction</td>
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<td>Module frequency</td>
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</tr>
<tr>
<td>Module capacity</td>
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<td>Teaching/Learning method</td>
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<tr>
<td>Previous knowledge</td>
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<tr>
<td>Examination</td>
<td>Examination times</td>
</tr>
<tr>
<td>Final exam of module</td>
<td>Preparation and submission of the master's thesis according to the examination regulations. Defense of the master thesis in a final colloquium</td>
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<td>SWS</td>
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<tr>
<td>Frequency</td>
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### inf862 - Study Abroad I

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| Applicability of the module | • Master's Programme Business Informatics (Master) > Kernmodule  
• Master's Programme Computing Science (Master) > Informatik, allgemein  
• Master's Programme Computing Science (Master) > Interdisziplinäre Module |
| Responsible persons | |
| Prerequisites | No participant requirements |
| Skills to be acquired in this module | |
| Module contents | |
| Recommended reading | |
| Links | |
| Language of instruction | German |
| Duration (semesters) | Semester |
| Module frequency | |
| Module capacity | unlimited |
| Module level | |
| Type of module | |
| Teaching/Learning method | |
| Previous knowledge | none |
| Examination | Examination times | Type of examination |
| Final exam of module | RE |
| Type of course | VA-Auswahl |
| SWS | |
| Frequency | -- |
| On-site workload | 0 h |
inf863 - Study Abroad II

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Kernmodule
- Master's Programme Computing Science (Master) > Informatik, allgemein
- Master's Programme Computing Science (Master) > Interdisziplinäre Module

**Responsible persons**

**Prerequisites**
- No participant requirements

**Skills to be acquired in this module**

**Module contents**

**Recommended reading**

**Links**

**Language of instruction**
- German

**Duration (semesters)**
- Semester

**Module frequency**

**Module capacity**
- Unlimited

**Module level**

**Type of module**

**Teaching/Learning method**

**Previous knowledge**
- None

**Examination**

<table>
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<tr>
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<th>Examination times</th>
<th>Type of examination</th>
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**Final exam of module**
- RE

**Type of course**
- VA-Auswahl

**SWS**

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**On-site workload**
- 0 h
## Akzentrsetzungsmodule Bereich Wirtschaftsinformatik

### inf537 - Intelligent Systems

<table>
<thead>
<tr>
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<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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| Applicability of the module | • Master's Programme Business Informatics (Master) > Akzentrsetzungsmodule Bereich Wirtschaftsinformatik 
  • Master's Programme Business Informatics (Master) > Akzentrsetzungsmodule der Informatik 
  • Master's Programme Computing Science (Master) > Angewandte Informatik 
  • Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction 
  • Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction 
  • Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering |
| Responsible persons         | • Sauer, Jürgen (module responsibility) 
  • Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites               | Production oriented business informatics                                             |
| Skills to be acquired in this module | **Professional competence**  
The students:  
• name the structure of agent-based systems  
• use problem-solving methods for complex problems  
• characterise the application area of process planning  
• evaluate the suitability of processes regarding to specific problems |
|                            | **Methodological competence**  
The students:  
• assign problem-solving methods to different problems |
|                            | **Social competence**  
The students:  
• implement selected methods in small teams |
|                            | **Self-competence**  
The students:  
• develop own solutions for given problems |
| Module contents             | A lot of application areas use "intelligent" problem-solving methods. These are the main focus of this lecture. They will be illustrated by examples in order to enhance the students' problem-solving abilities. **These include:**  
• A brief introduction into AI  
• Agent systems and  
• Solution methods of AI like heuristics, meta-heuristics, soft computing methods. To apply and foster the contents of the lecture, an intelligent planning system is implemented in practical exercises. |
| Recommended reading         | **Suggested reading:**  
• Sauer, J.: Intelligente Ablaufplanung in lokalen und verteilten Anwendungsszenarien, Teubner, 2004  
• Russel/Norvig: Künstliche Intelligenz, 3rd edition, Pearson, 2012  
• Ghallab/ Nau/Traverso: Automated Planning, Morgan Kaufman, 2004 |
<p>| Links                       | <a href="http://www.wi-ol.de">www.wi-ol.de</a>                                                                       |
| Languages of instruction    | German, English                                                                     |
| Duration (semesters)        | 1 Semester                                                                          |</p>
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<tr>
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<tr>
<td>Teaching/Learning method</td>
<td>1VL + 1Ü</td>
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<td>Production oriented business informatics</td>
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<td>At the end of the lecture period</td>
</tr>
<tr>
<td>Type of course</td>
<td>Comment</td>
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<tr>
<td>Lecture</td>
<td>2</td>
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# inf538 - Management of IT-Services

<table>
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<td>Workload</td>
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| Applicability of the module     | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik  
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons             | - Sauer, Jürgen (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                   | No participant requirements |

## Skills to be acquired in this module

### Professional competence
The students:

- characterise problems that occur during the operation of large-scale operating systems
- characterise conceptional, technical, economical and organizational problem-solving processes
- use these concepts to solve problems validly

### Methodological competence
The students:

- describe a current problem area based on information from the internet and literature

### Social competence
The students:

- present their findings on a problem area
- discuss their results regarding a specific application area

### Self-competence
The students:

- reflect actual concepts with regard to specific application areas

## Module contents

"Adaptive Computing" deals with the field of concepts and solutions to manage large scale application systems or dynamic data centers. Technically oriented solutions like the configuration of data centers such as the hard- and software virtualization, the high availability, the storage management and the identity management are not the only contributions of Adaptive Computing. Others are organisational aspects of companies, such as personnel planning and service agreements. This module provides and compiles current topics of Adaptive Computing. The module also presents and evaluates several Adaptive Computing technologies. Current HW-/ SW-concepts of large-scale application systems, strategies, service management and security concepts are specifically included. The lecture introduces current concepts and solutions for the management of dynamic data centers. Among others, the following subjects are provided:

- IT-Strategy, - Organisation
- ITIL (overview)
- Service-Management Tools (e.g. OTRS)
- Outsourcing
- Security (policies, privacy, data security, safety)
- Spatial design of data centers
- HW-Strategies: Cluster, Storage, ...
- Virtualization
- IdM
- Portals
- Configuration management
- Accounting, performance calculation and evaluation, performance indicators
- SOA, EAI
- Controlling tools, Monitoring
Recommended reading

- current company data
- current materials from internet
- Tiemeyer, Ernst: Handbuch IT-Management: Konzepte, Methoden, Lösungen und Arbeitshilfen für die Praxis, Hanser, 2006

Suggested reading:

Links

Language of instruction

- German

Duration (semesters)

- 1 Semester

Module frequency

- jährlich

Module capacity

- unlimited

Reference text

- Hier teste ich gerade zweiter Versuch

Module level

Type of module

- 1VL + 1S + 1Ü

Previous knowledge

- none

Examination

- Examination times
- Type of examination

Final exam of module

- at the end of the semester
- Portfolio

<table>
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<th>SWS</th>
<th>Frequency</th>
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<td>Vorlesung und Seminar</td>
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<td>SoSe</td>
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<td>Exercises</td>
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<td>2</td>
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<td>28</td>
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Total module attendance time

- 56 h
### inf541 - Data Challenge

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**Applicability of the module**

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**

- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (module responsibility)

**Prerequisites**

useful previous knowledge: Business Intelligence I, Business Intelligence II

**Skills to be acquired in this module**

After successful completion of the course, students should be able to answer specific, entrepreneurial questions with the help of data-driven methods. The handling of data should be mastered unerringly in the programming languages Python and/or R. Furthermore, competences in the field of algorithmics and data storytelling should be developed. The module teaches basic skills in the field of data science and the application of various methods and algorithms. The cooperation with a practice partner ensures that the students work on a problem that is as real and practical as possible. By working independently on the problem and the final presentation of the results, further soft skills of the students will be trained.

**Professional competence**

The students:

- learn how to handle structured and unstructured data sources.
- acquire practical knowledge about different methods of data science.
- learn basic procedures in the implementation of data science projects.
- follow and refine the implementation of the practical learning by means of a partly given model scenario, but also by self-initiatives.

**Methodological competence**

The students:

- are able to explore and analyze data sets
- recognize connections in large data sets
- form a hypothesis for the solution of a business problem.

**Social competence**

The students:

- work in groups, identify work packages and take on responsibility for the jobs assigned to them.
- discuss and introduce the results on a functional level.

**Self-competence**

The students:

- reflect their approach on the basis of self-defined goals.
- collect and analyze required information.
- prepare the collected information in a target group-oriented manner

**Module contents**

If methodological competence in the field of data science is to be learned and expanded, this is usually only possible with the help of open available, idealized data sets and exemplary tasks. Basic programming skills can be acquired in this way, but dealing with real business problems and solving them with the help of data science methods can only be learned through practice. In this module, a real problem of a practice partner is presented, this partner provides data and domain knowledge and then a data-centered solution for this problem must be designed and implemented independently.

**Within the module, the following topics are dealt with:**

- Exploration and analysis of data
- Methods of data science (e.g. deep learning)
- Dealing with programming languages and development frameworks (R, Python, Tensorflow)
- Hypothesis Formation and Data Storytelling
### Recommended reading


### Links

<table>
<thead>
<tr>
<th>Links</th>
<th><a href="https://uol.de/vlba">https://uol.de/vlba</a></th>
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### Language of instruction

German

### Duration (semesters)

1 Semester

### Module frequency

annual

### Module capacity

30

### Module level


### Teaching/Learning method

PR (Blockseminar)

### Previous knowledge

useful previous knowledge: Business Intelligence I, Business Intelligence II

### Examination

<table>
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<td>Portfolio</td>
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### Type of course

Practical training

### SWS

4

### Frequency

SoSe oder WiSe

### On-site workload

56 h
inf604 - Business Intelligence I

<table>
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<tbody>
<tr>
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**Applicability of the module**
- Master Applied Economics and Data Science (Master) > Data Science
- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

**Responsible persons**
- Marx Gómez, Jorge (authorised to take exams)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
- No participant requirement

**Skills to be acquired in this module**

**Objective of the module/skills:**
Current module provides basics of business intelligence with focus on enterprises and strong emphasis on data warehousing technologies. Students of the course are provided with knowledge, which reflects current research and development in a data analytic domain.

**Professional competence**
The students:
- name and recognize the role of business intelligence as part of daily business process
- being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies
- obtain theoretical knowledge about data collection and modelling processes, including most applicable approaches and best practices

**Methodological competence**
The students:
- being able to execute typical tasks of business intelligence, and also being able to deepen knowledge on different approaches and methods
- gain a hands on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge in most efficient ways

**Social competence**
The students:
- build solutions based on case studies given to the group, for example solving the issue of a factless fact table
- discuss solutions on a technical level
- present obtained case studies solutions as part of the exercises

**Self-competence**
The students:
- critically review provided data and information

**Module contents**
Data warehouse technology together with business intelligence are increasingly being used by business in order to get better decision support and enrich ongoing processes with data-rich decisions. Data warehouse technology enables an integration of data from heterogeneous sources, whether business intelligence builds data recprocessing on top of it. For instance, business intelligence allows to build reporting on very large volumes of data (including historical) coming primary from data warehouse.

As past of the current module following contents are taught:
Definition and scope of business intelligence.
- Procedures and objectives of data warehousing.
- Process of extracting, transforming and loading (ETL) of data.
- Phases of data modelling, data capturing and reporting in conjunction with a plausible case studies/scenarios.
- Prospects for further and evolving topics for business intelligence (e.g. Adaptive Business Intelligence, In-Memory Computing, etc.)
- Introduction to Data Mining.
- Case studies based practical exercises and assessments in order to impart practical knowledge.

Recommended reading
- Marx Gómez, Rautenstrauch, Cissek (2008): Einführung in die Business Intelligence mit SAP NetWeaver 7.0.

Links
http://www.wi-ol.de

Languages of instruction
German, English

Duration (semesters)
1 Semester

Module frequency
annual

Module capacity
unlimited

Module level

Type of module

Teaching/Learning method
1VL + 1Ü

Previous knowledge
none

Examination
Examination times
Type of examination

Final exam of module
At the end of the lecture period
Written exam max. 120 minutes

Type of course Comment SWS Frequency Workload of compulsory attendance
Lecture 2 WiSe 28
Exercises 2 WiSe 28

Total module attendance time 56 h
inf607 - Business Intelligence II

<table>
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**Applicability of the module**

- Master Applied Economics and Data Science (Master) > Data Science
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodulen der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

**Responsible persons**

- Marx Gómez, Jorge (authorised to take exams)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

No participant requirement

**Skills to be acquired in this module**

Current module provides advanced business intelligence, data science with focus on enterprises and strong emphasis on big data and data analytics. Students of the course are provided with knowledge, which reflects current research and development in a data analytics domain.

**Professional competence**

The students:

- name and recognize the role of data analytics / data science as part of a daily business process in a particular company
- able to organize from management perspective data analysis project
- being able to analyse advantages and disadvantages of different approaches and methods of the data analytics and being able to apply them in simple case studies
- obtain theoretical knowledge about data collection and modelling processes, including state of the art approaches and available best practices

**Methodological competence**

The students:

- being able to execute typical tasks of data analysis, and also being able to proceed deeper with respect to different approaches and methods
- gain a hands on experience and being able to understand advantages and disadvantages of different methods and being able to use obtained knowledge

**Social competence**

The students:

- build solutions based on case studies given to the group, for example design of regression model based on provided dataset
- discuss solutions on a technical level
- present obtained case studies solutions as part of the exercises

**Self-competence**

The students:

- critically review provided offered information

**Module contents**

After current course students will get advanced knowledge in the domains such as business intelligence and data analytics. Besides that, students will have a chance to have a deeper look into related technical fields such as InMemory Computing, Data Mining and Machine Learning, Big Data Processing with Distributed Systems (e.g. Apache Hadoop / Spark) from both, research and practical, perspectives. Students will be provided with real-world experience gather from business intelligence and data science related projects. Materials of the course are believed to be justified with current demands of data analytics market. Thus, providing students with relevant knowledge in order to give them advantages in future job.
### Recommended reading

- Jürgen Cleve, Uwe Lämmel (2014): "Data mining" (Deutsch)
- Max Bramer (2013): "Principles of data mining" (English)
- Ian Witten, Eibe Frank, Mark Hall (2011): "Data mining : practical machine learning tools and techniques" (English)
- Jure Leskovec, Anand Rajaraman, Jeffrey Ullman (2014): "Mining of massive datasets" (English)

### Links

<table>
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<tr>
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<th><a href="http://www.wi-ol.de/">http://www.wi-ol.de/</a></th>
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### Languages of instruction

- German, English

### Duration (semesters)

- 1 Semester

### Module frequency

- annual

### Module capacity

- unlimited

### Module level

### Type of module

<table>
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### Previous knowledge

- none

### Examination

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<th>Type of examination</th>
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### Final exam of module

- At the end of the lecture period
- Written exam (max. 120 min.)

### Type of course | Comment | SWS | Frequency | Workload of compulsory attendance |
|------------------|---------|-----|-----------|-----------------------------------|

| Lecture | 2 | SoSe | 28 |
| Exercises | 2 | SoSe | 28 |

### Total module attendance time

- 56 h
**inf650 - Transport Systems**

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**Applicability of the module**

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Embedded Brain Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

**Responsible persons**

- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**

Production-oriented business informatics

**Skills to be acquired in this module**

**Objective of the module/skills:**

The Module Transport systems deals with planning and controlling systems of internal and external company logistics as well as public transport. It provides basic knowledge and recent research topics. The focus is on a resource orientated holistic view of company logistics as well as the planning of transport infrastructure. Furthermore, trends such as autonomous vehicles and intelligent transport systems are discussed.

**Professional competence**

The students:

- name the basics of planning and controlling company logistics
- assess transport systems of companies
- name methods and approaches of computer aided transport systems and classify them
- characterise software to plan complex logistics

**Methodological competence**

The students:

- display topics and concepts of transport systems
- simulate transport and its systems with appropriate methods

**Social competence**

The students:

- work in groups
- discuss their results appropriately

**Self-competence**

The students:

- realise their limits while working on a project containing aspects of modelling and implementation
- question the presentation of their results

**Module contents**

- Transport and logistics concepts
- Data acquisition of company logistics
- Planning- and simulation software for complex logistics- and transport processes
- Energy- and resource efficient transport systems
- Resource oriented transport cost calculations (e.g. CO2, noise pollution)
- Planning models for transport infrastructure

**Recommended reading**

Suggested reading: 187 / 223
### Types of instruction
- German, English

### Duration (semesters)
- 1 Semester

### Module frequency
- annual

### Module capacity
- unlimited

### Reference text
- Dieses Modul ist im Rahmen der Projekte FliF und FoL konzipiert worden

### Type of module
- Production-oriented business informatics

### Previous knowledge
- Production-oriented business informatics

### Teaching/Learning method
- 1VL + 1Ü

### Examination
- Exercises and written exam

### Final exam of module
- At the end of the lecture period

### Type of course

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### Total module attendance time
- 56 h
inf651 - Environmental Management Information Systems I

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**Applicability of the module**
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM - interdisziplinär
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Master's Programme Sustainability Economics and Management (Master) > Additional Modules

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirement

**Skills to be acquired in this module**
This module completes the knowledge and abilities gained in the field of Environmental Informatics and it creates a strong reference to up to date topics in the field of sustainability. The content taught in this module can directly be applied in an upcoming study and professional career.

**Professional competence**
The students:
- are able to classify and explain the sustainability paradigm
- are aware of the current status of sustainability reporting
- are able to define and to model material flows
- have obtained know-how in the field of corporate environmental management information systems (CEMIS)

**Methodological competence**
The students:
- implement CEMIS
- apply different techniques and methods to case studies
- develop new case studies in teams

**Social competence**
The students:
- are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them
- present and discuss their own results with the team and the other members of the course

**Self-competence**
The students:
- learn about their own limitations and learn to accept criticism in order to strengthen their own abilities

**Module contents**
This course teaches methods, approaches and techniques in the field of information processing in order to support solutions to problems that arise from companies' impact on the environment. In particular, ICT supported approaches of production-integrated environmental protection, environmental controlling and reporting are introduced and discussed. In order to enable the integration of such approaches into environmental protection, environmental management and its systems are taught as well.

The content in detail:
- environmental management as a basis for sustainability
- sustainability and material flow management
- strategic environmental management
- eco-controlling life cycle
- characteristics and system architectures of CEMIS
- standard software systems
• environmental accounting systems

Recommended reading


Links
http://www.wi-ol.de

Language of instruction
German

Duration (semesters)
1 Semester

Module frequency
annual

Module capacity
unlimited

Module level

Type of module

Teaching/Learning method
1VL + 1Ü

Previous knowledge
none

Examination
Examination times

Type of examination

Final exam of module
At the end of the lecture period

exercises and written exam (max. 120 min.)

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Total module attendance time
56 h
# Production-oriented Business Informatics

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| Applicability of the module         | Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
                                      Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
                                      Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons                 | Sauer, Jürgen (module responsibility)    
                                      Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                       | No participant requirement               |
| Skills to be acquired in this module| The module deepens the contents of the modules „Wirtschaftsinformatik“ and „Wirtschaftsinformatik/Informationsmanagement“. The students will be able to contextualise IT systems and their functions in companies. They are able to participate in the implementation of IT systems in companies. The students know the essential tasks of materials management, production planning and controlling, warehousing, acquisition and supply chain management.  
  **Professional competence**  
  The students:  
  - name and differentiate the basics of business informatics and information management  
  - classify IT systems and their functions in companies  
  - name and characterise the essential tasks of materials management, production planning and controlling, warehousing, acquisition and supply chain management  
  **Methodological competence**  
  The students:  
  - transfer a holistic development process of production planning and control  
  - implement IT systems in businesses  
  **Social competence**  
  The students:  
  - participate in implementing IT systems in companies  
  - construct and present computational solutions to groups and within their work group  
  - integrate professional and objective criticism in their own and others’ results  
  **Self-competence**  
  The students:  
  - recognize the planning horizon for IT systems  
  - reflect their role and skills to implement IT systems in businesses |
| Module contents                     | The module “Production-oriented Business Informatics” deals especially with production planning and control processes affected by process planning tasks, as well as classic problems of industrial production. The lecture is focussed on the application of information systems in industrial production companies. Priorities are order flow business processes and PPS-/ERP-Systems. Case studies and demonstrations illustrate the application of these systems. |
| Recommended reading                 | Kurbel, Karl: Produktionsplanung und -steuerung im Enterprise Resource Planning und Supply Chain Management, Oldenbourg Verlag, 2005  
                                      Further literature will be announced in the lecture |
<p>| Links                               |                                         |
| Language of instruction             | German                                  |</p>
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Total module attendance time 56 h
inf653 - ERP Technologies

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**Applicability of the module**
- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirement

**Skills to be acquired in this module**

**Learning objectives**
- Generation of understandings into the working approaches and tasks of ERP systems
- Examining components of ERP systems
- Generating knowledge about important aspects of the operation processes of ERP systems, such as data storage and processing, user management, and system maintenance.

**Professional competence**
- The students:
  - describe ERP systems in compliance with functions and technologies
  - identify state-of-the-art and future architectures of ERP systems
  - discuss the usage of core technologies (also in practical case studies, for example with SAP NetWeaver)

**Methodological competence**
- The students:
  - categorize fundamental technologies in combination with other enterprise-wide information systems
  - apply the presented methods in practical contexts

**Social Competence**
- The students:
  - construct solutions to given problems in groups
  - present solutions to computing science problems before groups

**Self-competence**
- The students:
  - recognize the limit of their capacity in implementing and customizing of business application systems

**Module contents**
The module provides the following content:
- Overview of the components of ERP systems and their functionality and administration
- In-depth analysis of ERP system architecture under consideration of surface structures and user management in ERP systems, with focus on of data storage, particularly the used data models and database structures, backup and recovery strategies
- Deployment of ERP applications in form of application service providing, including the technical characteristics of this business model, especially Special Administration, delimitation and monitoring tasks for systems, which at the same time be provided several customers
- Lecture will be accompanied by SAP case studies.

**Recommended reading**
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<table>
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<th>Links</th>
<th><a href="http://www.wi-ol.de">http://www.wi-ol.de</a></th>
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## Module level

### Teaching/Learning method

- 1VL + 1Ü

### Previous knowledge

- none

### Examination

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### Type of course

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## Total module attendance time

- 56 h
# inf654 - Mobile Commerce

## Module label
Mobile Commerce

## Module abbreviation
inf654

## Credit points
6.0 KP

## Workload
180 h

### Applicability of the module
- Master of Education Programme (Vocational and Business Education) Computing Science (Master of Education) > Akzentsetzungsbereich
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

## Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

## Prerequisites
No participant requirement

## Skills to be acquired in this module
### Professional competence
The students:
- define and encompass MC
- explain the development stages of MC
- are aware of the current developments within MC and are able to classify them
- get to know technical essentials, functionalities and standards of wireless ICT
- assess the fields of application and limitations of wireless ICT
- examine the relevant mobile devices and their respective operating systems, know their characteristics and evaluate their fields of application
- examine market participants, assess business models, optimize business processes
- gain insight into specifics via examples and exercises

### Methodological competence
The students:
- get to know security aspects and specifics of mobile application design
- prototypically develop an Android application
- prepare and give presentations
- develop a concept of a business model for an Android application

### Social competence
The students:
- work on their project in groups of three

### Self-competence
The students:
- reflect their own group-dynamic activities in respect of a mutual goal (successfully finish their project)

## Module contents
See above

## Recommended reading
- Also all materials provided within the lecture

## Links
- [http://vba.wi-ol.de](http://vba.wi-ol.de)

## Language of instruction
German

## Duration (semesters)
1 Semester

## Module frequency
annual

## Module capacity
unlimited

## Module level
195 / 223
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## inf657 - Product Engineering

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### Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Engineering of Socio-Technical Systems (Master) > Human-Computer Interaction
- Master's Programme Engineering of Socio-Technical Systems (Master) > Systems Engineering

### Responsible persons
- Sauer, Jürgen (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
- No participant requirement

### Skills to be acquired in this module

**Focus of this module** is to learn and apply the product engineering process. A project will enable the students to design a product from the idea to the prototype. More specifically, a systematic, partial domain-specific, approach to solve technical problems and aspects of project management will be learned. Regular meetings are used to train the presentation capabilities of the students and to schedule working packages within the teams.

#### Professional competence

**The students:**
- learn and try out the handling of virtual and physical prototypes
- learn and try out the construction and validation of virtual prototypes with the aid of CAD-applications
- learn and combine different basic development concepts from the mechanical engineering, microelectronics, control engineering and software engineering

#### Methodological competence

**The students:**
- learn and try out project management concepts
- learn and recognise the connections of different development concepts from different fields, e.g. mechanical engineering, control engineering, microelectronics and software engineering
- develop own products with creativity techniques
- schedule and organise the product development supported by project management techniques independently
- learn the systematic refining of their own product idea with SysML
- design and test products with state-of-the-art CAD-applications

#### Social competence

**The students:**
- impart their structure and mode of action to other people
- develop their own products in small teams
- present their solutions to groups
- integrate criticism to their solutions
- support other groups by giving appropriate criticism

#### Self-competence

**The students:**
- recognise and reflect their own limitations to get familiar and to plan a project in an unknown field (e.g. maritime construction/industries)

### Module contents

This module is a lecture accompanied by a hands-on project. The students work on one product development task. The product development starts with the idea-finding/brainstorming process which is used to create a digital product concept. During the semester a digital prototype will be created and validated by its initial requirements. Finally, a physical prototype is produced with a 3D-Printer (Rapid Prototyping). The progress of the project has to be documented and presented at different milestones.

### Recommended reading
Ehrlenspiel (2003): Integrierte Produktentwicklung

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| Total module attendance time | 56 h |

198 / 223
## inf569 - Environmental Management Information Systems II

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### Applicability of the module
- Master's programme Business Administration: Management and Law (Master) > Schwerpunktmodule NM - interdisziplinär
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodulle Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodulle der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik
- Master's Programme Environmental Modelling (Master) > Mastermodule
- Master's Programme Sustainability Economics and Management (Master) > Additional Modules

### Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
- No participant requirement

### Skills to be acquired in this module
- This course aims at examining emerging research questions in the field of corporate environmental management information systems (CEMIS). After finishing this course, the students will have extensive knowledge regarding Business Environmental Informatics. In addition, they will be aware of recent research topics and challenges as well as relevant software solutions and practical projects.

#### Professional competence
- The students:
  - will obtain extensive knowledge in the field of CEMIS
  - know emerging research questions and challenges as well as software solutions and projects

#### Methodological competence
- The students:
  - find their own solutions or apply already existing approaches to new and unsolved questions in the field of CEMIS
  - capture required data, analyse it and present it to their team or the whole group

#### Social competence
- The students:
  - are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them
  - present and discuss their own results with the team and the other members of the course

#### Self-competence
- The students:
  - learn about their own limitations and learn to accept criticism in order to strengthen their own abilities

### Module contents
- A strong social pressure forces enterprises to question their current way of implementing their business and to include different aspects of sustainability into their strategies and operational actions. Such a rethinking of one's business is supported by corporate environmental management information systems. Such systems aim at optimising the energy and resource usage, emission and waste minimisation as well as production integrated environmental protection. Of course they support the fulfillment of legal requirements such as waste management or hazardous material handling.

The module will cover:
- recent and emerging research questions and topics related to the field of CEMIS as well as Business Environmental Informatics.
- discussion and hands-on experience of standard software systems and newly established solutions.
• applying the knowledge obtained to the definition of new as well as on solving new case studies.

Recommended reading

- Marx Gómez, Jorge, Scholtz, Brenda (Hrsg.) (2016): Information Technology in Environmental Engineering. Springer International Publishing

Links

- http://www.wi-ol.de

Languages of instruction

- German, English

Duration (semesters)

- 1 Semester

Module frequency

- annual

Module capacity

- unlimited

Reference text

- Type and language of program will be announced prior to the beginning of the course

Module level

Type of module

Teaching/Learning method

- 1VL + 1Ü or 1S

Previous knowledge

- none

Examination

Examination times

- Usually 2 weeks after the end of the lecture period

Type of examination

- Seminar paper and presentation or term paper

Final exam of module

Type of course

- Lecture
- Exercises

SWS

- 2
- 2

Frequency

- WiSe
- WiSe

Workload of compulsory attendance

- 28
- 28

Total module attendance time

- 56 h
inf660 - Sustainability Informatics

Module label: Sustainability Informatics
Module abbreviation: inf660
Credit points: 6.0 KP
Workload: 180 h

Type and language of program will be announced prior to the beginning of the course. The course is recognised as a practical project in the Master's programme Sustainability Economics and Management.

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
No participant requirement

Skills to be acquired in this module
After finishing this course, students should be able to set up a sustainability report tailored for different target groups for any kind of organization. The students will be enabled to know and apply different available standards and guidelines as well as to estimate the influence of data defects and the feasibility of recent information and communication technology. This course emphasizes the importance of sustainability reporting as a means of an organization's communication (internal and external) and provides an overview on relevant indicators, standards and guidelines. Based on that the handling of data defects and missing data as well as different approaches of reporting will be discussed. In addition, the specific requirements of different target groups regarding content and presentation of a report will be discussed as well.

Professional competence
The students:
- are aware of different indicators, standards and guidelines and know when to apply which.
- know different approaches of data capturing, interpolation of missing or corrupt data as well as the influence of each of these issues on the validity of a report.
- implement concepts for tailormade target group orientation.

Methodological competence
The students:
- prepare a small sustainability report based on their decision which standard or guideline to use.
- capture existing data and analyse it.
- prepare a tailormade target oriented presentation of their results.

Social competence
The students:
- are supposed to work in teams and therefore have to identify working packages and have to take on responsibility for the jobs assigned to them.
- present and discuss their own results with the team and the other members of the course

Self-competence
The students:
- learn about their own limitations and learn to accept criticism in order to strengthen their own abilities

Module contents
The following topics will be covered in this module:
- different definitions of the term sustainability.
- the importance of sustainability reporting as a means of an organisation's communication.
- LCA, environmental accounting, supply chain management as data
• semantic, comparability and transformation of indicators, standards and guidelines.
• interpolation and interpretation of data defects.
• how to report (e.g. knowledge management, document engineering, integrated reporting, different target groups).

Recommended reading

• Rautenstrauch, C. (1999), Betriebliche Umweltinformationssysteme, Springer-Verlag, Berlin

Links
http://vlba.wi-ol.de

Languages of instruction
German, English

Duration (semesters)
1 Semester

Module frequency
unlimited

Reference text
Die Lehrveranstaltung wird im Masterstudiengang Sustainability Economics and Management als practical project anerkannt.

Module level

Type of module
Teaching/Learning method
1VL + 1Ü oder 1PR

Previous knowledge
none

Examination
Examination times
Type of examination
Seminar paper and presentation or exercises and exam

Final exam of module

Type of course Comment SWS Frequency Workload of compulsory attendance
Lecture 2 SoSe 28
Übung oder Praktikum 2 SoSe 28

Total module attendance time 56 h
## inf6602 - Sustainable Information Systems

<table>
<thead>
<tr>
<th>Module label</th>
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<td>Module abbreviation</td>
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<tr>
<td>Credit points</td>
<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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### Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

### Responsible persons
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

### Prerequisites
Programming experience is an advantage but not necessary

### Skills to be acquired in this module
- Understanding of Green Information Systems concepts and related theories
- Overview of sustainability topics in information systems research
- Understanding of the basics of decision support systems and ability to develop decision support systems in an environmental context
- Research methods in IS research in Green IS

### Professional competences
The students
- know about the role of information systems research insustainability questions
- know how to use information systems to control sustainability in companies
- have an overview of the use cases for decision support tools in sustainability questions

### Methological competences
The students
- are able to build decision support tools for sustainability purposes
- know how to apply Design Science Research techniques
- are able to build online experiments using otree
- are able to generate research results based on case studies or surveys

### Social competences
The students
- improve their teamwork competencies in group exercises
- improve their presentation skills through exercise

### Self competences
The students
- improve their time management through submission deadlines
- lean about the role and importance of energy markets for society

### Module contents

### Recommended reading
<table>
<thead>
<tr>
<th>Links</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>Duration (semesters)</td>
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<tr>
<td>Module frequency</td>
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<td>Teaching/Learning method</td>
<td>1VL + 1Ü</td>
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<td>Previous knowledge</td>
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<tr>
<td>Examination</td>
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</tr>
<tr>
<td>Examination times</td>
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</tr>
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<td>Type of examination</td>
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<tr>
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<td>Two exams spread over the semester break</td>
</tr>
<tr>
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<td>Comment</td>
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<td>SWS</td>
</tr>
<tr>
<td>Exercises</td>
<td>Frequency</td>
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<tr>
<td>Total module attendance time</td>
<td>Workload of compulsory attendance</td>
</tr>
</tbody>
</table>

| Lecture                                   | SoSe                                  |
|                                           | 0                                    |
| Exercises                                 | SoSe                                  |
|                                           | 0                                    |
| **Total module attendance time**          | **0 h**                               |
inf661 - Digital Transformation

<table>
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<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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Applicability of the module

- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons

- Marx Gómez, Jorge (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites

No participant requirements

Skills to be acquired in this module

After successful completion of the lecture, the students should be able to define enabler and actors of a digital transformation within the context of a model company. Furthermore, key competences such as Cloud Computing or IoT are used to make potential exploitation by new digital business models visible. The results will be evaluated. The lecture explains basic properties of a digital transformation for companies and shows specific development potential. By forming and building a model company, students are able to create a realistic and practical scenario. A final documentation reveals the degree of fulfillment and the students point of view on the scenario.

Professional competence

The students:

- recognize basic properties and facts of a digital transformation for companies
- decide different terms of digital transformation
- expose actual introduction projects
- compile practical knowledge by dividing goals of enabler and actors of a digital transformation
- obtain basic knowledge of key competences such as IT-Security, Data Analytics, Big Data, Cloud Computing
- identify digital business models within the specific development potential

Methodological competence

The students:

- determine and analyse required information
- prepare the given information for specific target groups
- establish an analytical understanding of digital enterprise structures within key competences and applications

Social competence

The students:

- work in groups, identify work packages and take on responsibility for the jobs assigned to them
- discuss and introduce the results on a functional level

Self-competence

The students:

- reflect their actions on the basis of self defined objectives
- analyse their own state of knowledge

Module contents

Within the lecture the upcoming topics are discussed:

- definition and introduction of digital transformation
- success factors, market changes and introductory projects
- enabler of a digital transformation (competences, applications and structures)
- digital business models and networks - actors of a digital transformation
- industry 4.0 in the context of a digital transformation

Recommended reading
Links http://www.wi-ol.de

Languages of instruction German, English

Duration (semesters) 1 Semester

Module frequency

Module capacity unlimited

Module level

Type of module

Teaching/Learning method 1VL + 1Ü

Previous knowledge none

Examination Examination times Type of examination

Final exam of module After the end of the lecture period. Papers, project or written examination. Announcement at the beginning of the lecture period.

Type of course Comment SWS Frequency Workload of compulsory attendance

Lecture 2 SoSe 28

Exercises 2 SoSe 28

Total module attendance time 56 h

### inf690 - Special Topics in 'Business Informatics' I

<table>
<thead>
<tr>
<th>Module label</th>
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<tr>
<td>Module abbreviation</td>
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<tr>
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<td>6.0 KP</td>
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<tr>
<td>Workload</td>
<td>180 h</td>
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</table>
| Applicability of the module | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons | - Marx Gómez, Jorge (module responsibility)  
- Sauer, Jürgen (module responsibility)  
- Staudt, Philipp (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites | No participant requirements |
| Skills to be acquired in this module | This module integrates current developments in the field in adequate study courses.  
**Professional competences**  
The students:  
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general  
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits  
- identify, structure and solve problems/tasks, also in new or developing subject areas  
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines  
- are aware of the current limits and contribute to the development of computer science research and technology  
- discuss and evaluate recent computer science developments  

**Methodological competences**  
The students:  
- evaluate and apply tools, technology and methods sophisticatedly  
- combine new and original approaches and methods creatively  
- evaluate problems/tasks, including new or developing subject areas of their discipline and  
- apply computer science methods for solutions and research  

**Social competences**  
The students:  
- support team process by their abilities  

**Self-competences**  
The students:  
- pursue the overall and special computer science development critically  
- implement innovative professional activities effectively and independently |
<p>| Module contents | See assigned course description |
| Recommended reading | As announced in course |
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | irregular |
| Module capacity | unlimited |
| Module level |  |
| Type of module |  |
| Teaching/Learning method | 2 events from V, S, Ü, P, PR |
| Previous knowledge | none |</p>
<table>
<thead>
<tr>
<th>Examination</th>
<th>Examination times</th>
<th>Type of examination</th>
</tr>
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<tbody>
<tr>
<td>Final exam of module</td>
<td>At the end of the lecture period</td>
<td>Portfolio or presentation or oral exam</td>
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<tr>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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</tr>
<tr>
<td>On-site workload</td>
<td>56 h</td>
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## inf691 - Special Topics in 'Business Informatics' II

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Module abbreviation</td>
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<tr>
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<td>6.0 KP</td>
</tr>
<tr>
<td>Workload</td>
<td>180 h</td>
</tr>
</tbody>
</table>
| Applicability of the module   | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodulen der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons           | Marx Gómez, Jorge (module responsibility)  
Sauer, Jürgen (module responsibility)  
Staudt, Philipp (module responsibility)  
Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites                 | No participant requirements                |
| Skills to be acquired in this module | This module integrates current developments in the field, especially with a focus on corporate environmental management information systems, in adequate study courses. |

### Professional competences

The students:

- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

### Methodological competences

The students:

- evaluate and apply tools, technology and methods sophisticatedly
- combine new and original approaches and methods creatively
- evaluate problems/tasks, including new or developing subject areas of their discipline and
- apply computer science methods for solutions and research

### Social competences

The students:

- support team process by their abilities

### Self-competences

The students:

- pursue the overall and special computer science development critically
- implement innovative professional activities effectively and independently

<table>
<thead>
<tr>
<th>Module contents</th>
<th>See assigned course description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended reading</td>
<td>As announced in course</td>
</tr>
<tr>
<td>Language of instruction</td>
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</tr>
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<td>Duration (semesters)</td>
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<td>Type of module</td>
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<tr>
<td>Teaching/Learning method</td>
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<tr>
<td>Previous knowledge</td>
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<tr>
<td>Examination</td>
<td>Examination times</td>
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<td>At the end of the lecture period</td>
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<tr>
<td>Type of course</td>
<td>VA-Auswahl</td>
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<tr>
<td>SWS</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
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inf692 - Special Topics in 'Business Informatics' III

<table>
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<tr>
<td>Workload</td>
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</table>
| Applicability of the module | - Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik  
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik  
- Master's Programme Computing Science (Master) > Angewandte Informatik |
| Responsible persons | - Marx Gómez, Jorge (module responsibility)  
- Sauer, Jürgen (module responsibility)  
- Staudt, Philipp (module responsibility)  
- Lehrenden, Die im Modul (authorised to take exams) |
| Prerequisites | No participant requirements |
| Skills to be acquired in this module | This module integrates current developments in the field, especially with a focus on business intelligence, in adequate study courses.  
**Professional competences**  
The students:  
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general  
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits  
- identify, structure and solve problems/tasks, also in new or developing subject areas  
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines  
- are aware of the current limits and contribute to the development of computer science research and technology  
- discuss and evaluate recent computer science developments  
**Methodological competences**  
The students:  
- evaluate and apply tools, technology and methods sophisticatedly  
- combine new and original approaches and methods creatively  
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research  
**Social competences**  
The students:  
- support team process by their abilities  
**Self-competences**  
The students:  
- pursue the overall and special computer science development critically  
- implement innovative professional activities effectively and independently |
| Module contents | See assigned course description |
| Recommended reading | As announced in course |
| Links |  
| Language of instruction | German |
| Duration (semesters) | 1 Semester |
| Module frequency | irregular |
| Module capacity | unlimited |
| Module level |  
| Type of module |  
| Teaching/Learning method | 2 events form V, S, Ü, P, PR |
| Previous knowledge | none |
| Examination | Examination times |
| Final exam of module | At the end of the lecture period |
| Type of course | Portfolio or presentation or oral exam |
| Type of course | VA-Auswahl |
| SWS | 4 |
| Frequency | SoSe oder WiSe |
| On-site workload | 56 h |
inf693 - Special Topics in 'Business Informatics' IV

<table>
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<tbody>
<tr>
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<tr>
<td>Workload</td>
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Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Skills to be acquired in this module

Professional competences
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

Methodological competences
The students:
- evaluate and apply tools, technology and methods sophisticatedly
- combine new and original approaches and methods creatively
- evaluate problems/tasks, including new or developing subject areas of their discipline and
- apply computer science methods for solutions and research

Social competences
The students:
- support team process by their abilities

Self-competences
The students:
- pursue the overall and special computer science development critically
- implement innovative professional activities effectively and independently

Module contents
See assigned course description

Recommended reading
As announced in course

Links

Language of instruction | German
Duration (semesters) | 1 Semester
Module frequency | irregular
Module capacity | unlimited
Module level

Type of module
2 events from V, S, Ü, P, PR

Previous knowledge
none
<table>
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<tr>
<th>Examination</th>
<th>Examination times</th>
<th>Type of examination</th>
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<tr>
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<td>At the end of the lecture period</td>
<td>Portfolio or presentation or oral exam</td>
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<tr>
<td>Type of course</td>
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<tr>
<td>SWS</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
<td></td>
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<td>On-site workload</td>
<td>56 h</td>
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</tbody>
</table>
inf694 - Current Topics in 'Business Informatics' I

Module label | Current Topics in 'Business Informatics' I
---|---
Module abbreviation | inf694
Credit points | 3.0 KP
Workload | 90 h

Applicability of the module
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites
No participant requirements

Skills to be acquired in this module
This module integrates current developments in the field in adequate study courses.

**Professional competences**
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

**Methodological competences**
The students:
- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

**Social competences**
The students:
- communicate with users and experts convincingly

**Self-competences**
The students:
- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

Module contents
See assigned course description

Recommended reading
As announced in course

Links

Language of instruction | German
Duration (semesters) | 1 Semester
Module frequency | irregular
Module capacity | unlimited
Module level | Type of module
Teaching/Learning method | 1S or 1VL
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<td>Examination times</td>
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<tr>
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<td>At the end of the lecture period</td>
</tr>
<tr>
<td>Type of course</td>
<td>Course or seminar</td>
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<td>SWS</td>
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<tr>
<td>Frequency</td>
<td>SoSe oder WiSe</td>
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<td>On-site workload</td>
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inf695 - Current Topics in 'Business Informatics' II

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<td>• Master's Programme Business Informatics (Master) &gt; Akzentsetzungsmodul der Informatik</td>
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<td>• Master's Programme Computing Science (Master) &gt; Angewandte Informatik</td>
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<td>Responsible persons</td>
<td>• Marx Gómez, Jorge (module responsibility)</td>
</tr>
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<td></td>
<td>• Sauer, Jürgen (module responsibility)</td>
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<td>Skills to be acquired in this module</td>
<td>This module integrates current developments in the field, especially with a focus on corporate environmental management information systems, in adequate study courses.</td>
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<td><strong>Professional competences</strong></td>
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<td>• apply state of the art and innovative methods to solve problems, if necessary from other disciplines</td>
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<td>• are aware of the current limits and contribute to the development of computer science research and technology</td>
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<td>• discuss and evaluate recent computer science developments</td>
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<td><strong>Methodological competences</strong></td>
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<td>• examine tasks with technical and research literature, write an academic article and present their solutions academically</td>
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<td>• evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research</td>
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<td>• schedule time processes and resources</td>
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<td>• communicate with users and experts convincingly</td>
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<td><strong>Self-competences</strong></td>
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<td>The students:</td>
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<td>• pursue the overall and special computer science development critically</td>
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<td>• develop and reflect self-developed hypotheses to theories independently</td>
</tr>
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<td>Recommended reading</td>
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<td><strong>Teaching/Learning method</strong></td>
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inf696 - Current Topics in 'Business Informatics' III

Module label: Current Topics in 'Business Informatics' III
Module abbreviation: inf696
Credit points: 3.0 KP
Workload: 90 h

Applicability of the module:
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodule der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

Responsible persons:
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

Prerequisites: No participant requirements

Skills to be acquired in this module:
This module integrates current developments in the field, especially with a focus on business intelligence, in adequate study courses.

Professional competences
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

Methodological competences
The students:
- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

Social competences
The students:
- communicate with users and experts convincingly

Self-competences
The students:
- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

Module contents: See assigned course description
Recommended reading: As assigned in course

Language of instruction: German
Duration (semesters): 1 Semester
Module frequency: irregular
Module capacity: unlimited
Module level: 
Teaching/Learning method: 1S + 1VL

Links: 

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inf697 - Current Topics in 'Business Informatics' IV

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**Applicability of the module**
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul Bereich Wirtschaftsinformatik
- Master's Programme Business Informatics (Master) > Akzentsetzungsmodul der Informatik
- Master's Programme Computing Science (Master) > Angewandte Informatik

**Responsible persons**
- Marx Gómez, Jorge (module responsibility)
- Sauer, Jürgen (module responsibility)
- Staudt, Philipp (module responsibility)
- Lehrenden, Die im Modul (authorised to take exams)

**Prerequisites**
No participant requirements

**Skills to be acquired in this module**
This module integrates current developments in the field in adequate study courses.

**Professional competences**
The students:
- define and contrast a computer science part, in which they are specialised, in detail or evaluate computer science in general
- recognise and evaluate applied techniques and methods of their subject and are aware of their limits
- identify, structure and solve problems/tasks, also in new or developing subject areas
- apply state of the art and innovative methods to solve problems, if necessary from other disciplines
- are aware of the current limits and contribute to the development of computer science research and technology
- discuss and evaluate recent computer science developments

**Methodological competences**
The students:
- examine tasks with technical and research literature, write an academic article and present their solutions academically
- evaluate problems/tasks, including new or developing subject areas of their discipline and apply computer science methods for solutions and research
- schedule time processes and resources

**Social competences**
The students:
- communicate with users and experts convincingly

**Self-competences**
The students:
- pursue the overall and special computer science development critically
- develop and reflect self-developed hypotheses to theories independently

**Module contents**
See assigned course description

**Recommended reading**
As assigned in course

**Language of instruction**
German

**Duration (semesters)**
1 Semester

**Module frequency**
irregular

**Module capacity**
unlimited

**Module level**

**Type of module**

**Teaching/Learning method**
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