Module Catalogue
for the Subject
Information Systems
as a Master’s with 1 major
with the degree "Master of Science"
(120 ECTS credits)

Examination regulations version: 2019
Responsible: Faculty of Business Management and Economics
## Contents

The subject is divided into

Content and Objectives of the Programme

Abbreviations used, Conventions, Notes, In accordance with

Compulsory Courses

- Information Processing within Organizations
- IT-Management
- Project Seminar

Compulsory Electives I: Fundamentals Computer Science

- Information Retrieval
- Analysis and Design of Programs
- Security of Software Systems
- Software Architecture
- Artificial Intelligence 1
- Discrete Event Simulation
- Advanced Programming

Compulsory Electives II: Tracks

**Track 1: Enterprise Systems**

- Business Software 1: IS-based Enterprise Management
- Business Software 2: Enterprise Resource Planning Systems
- Advanced Seminar: Enterprise Systems

**Track 2: Business Analytics**

- Decision Support Systems
- Analytical Information Systems
- Business Analytics

**Track 3: Electronic Business**

- E-Business Strategies
- Mobile and Ubiquitous Systems
- Seminar: E-Business Strategies

**Track 4: Global Operations and Information Management**

- Corporate Entrepreneurship
- Digital Entrepreneurship
- Advanced Seminar: Entrepreneurship and Management

**Track 5: Operations Management**

- Global Logistics & Supply Chain Management
- Advanced Operations & Logistics Management
- Seminar: Operations Management

Compulsory Electives III: Electives

- Adaption and Continuous System Engineering
- Business Service Platforms 2
- Business Service Platforms 1
- Work and Information
- Work Order Planning for Automated Manufacturing
- Topics in Business Information Systems 1
- Topics in Business Information Systems 2
- Information systems research
- Databases 2
- Compiler Construction
- Information Retrieval
- Artificial Intelligence 1
- Artificial Intelligence 2
E-Learning
Analysis and Design of Programs
Professional Project Management
Algorithms for Geographic Information Systems
Real-Time Interactive Systems
Logic Programming
Machine Learning for Natural Language Processing
Medical Informatics
Performance Engineering & Benchmarking of Computer Systems
Programming with neural nets
Robotics 1
Security of Software Systems
Discrete Event Simulation
Software Architecture
NLP and Text Mining
Project - Current Topics in Computer Science
International Marketing
Brand Management & Market Research
Strategic Networks in Industry
Strategic Marketing
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Industrial Management 3
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Financial Statement Analysis and Business Valuation
Philosophy of Science and Ethics in Business Management and Economics
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Discounted Cashflow
Portfolio and Capital Market Theory
Risk Management and Corporate Finance
Risk measurement and risk valuation: Concepts and applications for banks
Economics of Tax Planning
Tax Accounting
Incentives in Organizations
Human Resource Management and Industrial Relations
Advanced Seminar: Entrepreneurship and Management
Corporate Strategy
Change Management
Managerial Accounting in the Company Management
Strategic Managerial Accounting
Coordination, Budgeting and Incentives in Organizations
Project Management and Control
Accounting and Capital Markets
Managerial Analytics & Decision Making
Strategic Management of Global Supply Chains
Strategic Decisions and Competition
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Content and Objectives of the Programme

»Information Systems« comprises the two disciplines: business management und informatics, and at the same time it places special emphasis on the integration of economic processes and informational automatisation. The curriculum of the Bachelor of Science offers the students basic knowledge which is deepened and broadened in the consecutive Master programme.

The target of the programme is to learn academically grounded methods as well as up-to-date research methods. Practical applications are also part of the programme, for instance in the research project VULCAN. Here the students work as administrators, department heads or executive directors in an ERP-system of the model company LIVE PLC and act in a virtual world as a company. Within a mandatory internship students additionally build up capabilities for teamwork as well as planning, shaping, and implementing a project. Here skills such as analysis of business transactions, various approaches of problem solving and the independent work will be developed. Students have the freedom to develop creative and innovative concepts themselves and work on various solutions.

The specialized education and the training of social competences enable students to get insight into various fields of their future professional work. The students learn the basics in order to adapt themselves to the dynamic discipline in a quick and flexible manner.

The comprehension of conceptual ways of process functioning and process flows is today more important than ever before. Therefore professionals who are well grounded in this area are crucial for a national economy. The interdisciplinary course of studies »Information Systems« conveys knowledge on efficient and profitable business.

The students should demonstrate in their written Master thesis and their previous academic papers that they are capable of working on a defined topic from the field of business information systems in limited time. Defining a theme, working on it by means of obtained academic methods as well as developing students’ own ideas are crucial for the study. In this way they obtain the know-how and prerequisites necessary for a potential PhD qualification.
Abbreviations used

Course types: E = field trip, K = colloquium, O = conversatorium, P = placement/lab course, R = project, S = seminar, T = tutorial, Ü = exercise, V = lecture

Term: SS = summer semester, WS = winter semester

Methods of grading: NUM = numerical grade, B/NB = (not) successfully completed

Regulations: (L)ASPO = general academic and examination regulations (for teaching-degree programmes), FSB = subject-specific provisions, SFB = list of modules

Other: A = thesis, LV = course(s), PL = assessment(s), TN = participants, VL = prerequisite(s)

Conventions

Unless otherwise stated, courses and assessments will be held in German, assessments will be offered every semester and modules are not creditable for bonus.

Notes

Should there be the option to choose between several methods of assessment, the lecturer will agree with the module coordinator on the method of assessment to be used in the current semester by two weeks after the start of the course at the latest and will communicate this in the customary manner.

Should the module comprise more than one graded assessment, all assessments will be equally weighted, unless otherwise stated below.

Should the assessment comprise several individual assessments, successful completion of the module will require successful completion of all individual assessments.

In accordance with

the general regulations governing the degree subject described in this module catalogue:

ASPO2015

associated official publications (FSB (subject-specific provisions)/SFB (list of modules)):

11-Nov-2020 (2020-103)
09-Jun-2021 (2021-61)
27-Apr-2022 (2022-27)

This module handbook seeks to render, as accurately as possible, the data that is of statutory relevance according to the examination regulations of the degree subject. However, only the FSB (subject-specific provisions) and SFB (list of modules) in their officially published versions shall be legally binding. In the case of doubt, the provisions on, in particular, module assessments specified in the FSB/SFB shall prevail.
Compulsory Courses

(25 ECTS credits)
Module title  | Abbreviation
--- | ---
Information Processing within Organizations | 12-IV-161-m01

**Module coordinator**

holder of the Chair of Business Management and Business Information Systems

**Module offered by**

Faculty of Business Management and Economics

**ECTS | Method of grading | Only after succ. compl. of module(s)**
--- | --- | ---
5 | numerical grade | --

**Duration | Module level | Other prerequisites**
--- | --- | ---
1 semester | graduate | --

**Contents**

**Content:**
This course provides students with an in-depth overview of the structure and the application areas of business management information systems in enterprises and public institutions.

**Outline of syllabus:**
1. What is software: concepts, categories, application
2. Software life cycle: duration, phases, steps
3. As-is analysis: tasks, problems
4. To-be concept: system design, data design, dialog design, function design
5. Object orientation: paradigm shift
6. Change management: meaning, methodologies, project management
7. Office automation: tasks, areas of application

**Intended learning outcomes**

After completing the course "Integrated Information Processing", students will be able to
(i) understand the importance of integration in enterprises, especially in information systems;
(ii) assess the progress of development of a software project, estimate cycle costs, know and consider requirements, which brings a software implementation with;
(iii) select the correct procedures or practices in an as-is analysis and target conception and practically apply (with participation in the exercise);
(iv) understand the importance of change management and project management and know the appropriate methods for specific applications.

**Courses**
(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 minutes)
Language of assessment: German and/or English
creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
--- | ---
IT-Management | 12-M-ITM-161-m01

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Contents

Content:
This course provides students with an in-depth overview of aims, tasks and appropriate methods of IT management.

Outline of syllabus:
1. Organisation and distinction
2. IT strategy
3. IT organisation
4. Management of IT systems
5. Enterprise Architecture Management
6. IT project management
7. IT security
8. IT law
9. IT controlling

Reading:
- Tiemeyer: Handbuch IT-Management, Munich.
- Hanschke: Strategisches Management der IT-Landschaft, Munich.

Intended learning outcomes

After completing the course “IT Management”, students will be able to
1. overview the different aspects to be considered regarding a purposeful IT management;
2. understand and apply appropriate methods and tools;
3. independently perform system search and selection in a team project (only after participation in the practice lessons).

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) oral examination (one candidate each: approx. 15 to 20 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)

Language of assessment: German and/or English creditable for bonus

Allocation of places

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Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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<td>Holder of the Chair of Business Management and Business Information Systems</td>
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**Contents**

Content:
In small project teams of 4 to 10 members, students will spend several months actively working on a specific and realistic problem with practical relevance. They will progress through several project stages including as-is analysis, to-be conception and implementation of an IS solution. The project teams will be required to work independently and will only receive advice and minor support from research assistants.

Reading:
will vary according to topic

**Intended learning outcomes**

After completing the course "Projektseminar", students will be able to
1. analyze business tasks and requirements and generate fitting IS solutions;
2. apply project management methods;
3. internalize stress, time and conflict management by means of practical teamwork.

**Courses** (type, number of weekly contact hours, language — if other than German)

S (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

project: preparing a conceptual design (approx. 150 hours), designing and implementing an approach to solution (approx. 300 hours) as well as presentation (approx. 20 minutes), weighted 1:2:1
Language of assessment: German, English
Creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Compulsory Electives I: Fundamentals Computer Science
(10 ECTS credits)
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<td>Information Retrieval</td>
<td>10-I=IR-161-m01</td>
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<td>Dean of Studies Informatik (Computer Science)</td>
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**Contents**

- IR models (e.g. Boolean and vector space model, evaluation),
- processing of text (tokenising, text properties),
- data structures (e.g. inverted index),
- query elements (e.g. query operations, relevance feedback, query languages and paradigms, structured queries),
- search engine (e.g. architecture, crawling, interfaces, link analysis),
- methods to support IR (e.g. recommendation systems, text clustering and classification, information extraction).

**Intended learning outcomes**

The students possess theoretical and practical knowledge in the area of information retrieval and have acquired the technical know-how to create a search engine.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 60 to 120 minutes).
- If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

- Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): IT, IS, HCI, GE

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module title
Analysis and Design of Programs

### Abbreviation
10-I=PA-161-m01

### Module coordinator
holder of the Chair of Computer Science II

### Module offered by
Institute of Computer Science

### ECTS
5

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Program analysis, model creation in software engineering, program quality, test of programs, process models.

### Intended learning outcomes
The students are able to analyse programs, to use testing frameworks and metrics as well as to judge program quality.

### Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

### Allocation of places
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### Additional information
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):
SE,IS,ES,GE

### Referred to in LPO
(examination regulations for teaching-degree programmes)
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### Contents

The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on modern computer systems, as well as the measures implemented to protect against these attacks. In the course, the following topics are discussed:

- x86-64 instruction set architecture and assembly language
- Runtime attacks (code injection, code reuse, defenses)
- Web security
- Blockchains and smart contracts
- Side-channel attacks
- Hardware security

### Intended learning outcomes

Students gain a deep understanding of software security, from hardware and low-level attacks to modern concepts such as blockchains. The lecture prepares for research in the area of security and privacy, while the exercises allow students to gain hands-on experience with attacks and analysis of systems from an attacker’s perspective.

### Courses

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Module taught in: English

### Method of assessment

- written examination (approx. 60 to 120 minutes).
- If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
- Language of assessment: English
- creditable for bonus

### Allocation of places

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### Additional information

- Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IS, LR, HCI, ES.
- Basic programming knowledge in C is required.

### Referred to in LPO I

(examination regulations for teaching-degree programmes)
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**Contents**

Current topics in the area of aerospace.

**Intended learning outcomes**

The students possess a fundamental and applicable knowledge about advanced topics in software engineering with a focus on modern software architectures and fundamental approaches to model-driven software engineering.

**Courses** (type, number of weekly contact hours, language — if other than German)

- V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- written examination (approx. 60 to 120 minutes).
- If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
- Language of assessment: German and/or English
- creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):

- SE, IT, ES

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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**Contents**

Intelligent agents, uninformed and heuristic search, constraint problem solving, search with partial information, propositional and predicate logic and inference, knowledge representation.

**Intended learning outcomes**

The students possess theoretical and practical knowledge about artificial intelligence in the area of agents, search and logic and are able to assess possible applications.

**Courses**

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):

AT, SE, IS, HCI

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Discrete Event Simulation | 10-I-ST-161-m01

Module coordinator | Module offered by
holder of the Chair of Computer Science III | Institute of Computer Science

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<tr>
<td>1 semester</td>
<td>graduate</td>
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Contents
Introduction to simulation techniques, statistical groundwork, creation of random numbers and random variables, random sample theory and estimation techniques, statistical analysis of simulation values, inspection of measured data, planning and evaluation of simulation experiments, special random processes, possibilities and limits of model creation and simulation, advanced concepts and techniques, practical execution of simulation projects.

Intended learning outcomes
The students possess the methodic knowledge and the practical skills necessary for the stochastic simulation of (technical) systems, the evaluation of results and the correct assessment of the possibilities and limits of simulation methods.

Courses (type, number of weekly contact hours, language — if other than German)
V (4) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

Allocation of places
--

Additional information
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): IT, IS, ES, GE

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Contents

With the knowledge of basic programming, taught in introductory lectures, it is possible to realize simpler programs. If more complex problems are to be tackled, suboptimal results like long, incomprehensible functions and code duplicates occur. In this lecture, further knowledge is to be conveyed on how to give programs and code a sensible structure. Also, further topics in the areas of software security and parallel programming are discussed.

### Intended learning outcomes

Students learn advanced programming paradigms especially suited for space applications. Different patterns are then implemented in multiple languages and their efficiency measured using standard metrics. In addition, parallel processing concepts are introduced culminating in the use of GPU architectures for extremely quick processing.

### Courses

- **V (2) + Ü (2)**
  - Module taught in: English

### Method of assessment

- **written examination (90 to 120 minutes)**
  - Language of assessment: English
  - creditable for bonus

### Allocation of places

- **--**

### Additional information

- **--**

### Referred to in LPO I

- **(examination regulations for teaching-degree programmes)**
  - **--**
Compulsory Electives II: Tracks

(40 ECTS credits)

Out of the five tracks, students may select two.
Track 1: Enterprise Systems
(20 ECTS credits)
Module title: Business Software 1: IS-based Enterprise Management

Abbreviation: 12-GPU-192-m01

Module coordinator: Holder of the Chair of Business Management and Business Information Systems

Module offered by: Faculty of Business Management and Economics

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<td>graduate</td>
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Contents:

Content:
This module provides students with an overview of the structure of a business information system (SAP Business ByDesign) in depth.

Outline of syllabus:
1. Integrated information systems: integration, standard software, system architecture
2. Working with standard business software
3. Consulting in integrated information systems: project management, project organisation, presentation skills

Description:
The lecture will be accompanied by an exercise that will present students with an opportunity to access, in small groups, the enterprise resource planning system operated by the Chair in its ERP laboratory and to work with the software, dealing with a wide variety of business processes.

If you would like to register for this course, please submit an application to the consultants (cover letter, CV, certificates; please also specify your degree programme and student ID number).

Intended learning outcomes:
After completing the course “Business Software 1”, students will be able to
(i) understand an ERP system in its depth;
(ii) understand the interaction of business processes;
(iii) execute business tasks and processes in an ERP system independently (after participation in the practice lessons).

Courses (type, number of weekly contact hours, language — if other than German):
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus):
a) Written examination (approx. 60 minutes) or
b) oral examination (one candidate each: approx. 10 to 15 minutes, groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes) or
c) Term paper (15 to 20 pages) or
Creditable for bonus
Language of assessment: German and/or English
Assessment offered: Once a year, winter semester

Allocation of places:
20 places.
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Master’s students of Information Systems will be given preferential consideration.
(2) The remaining places will be allocated to students of other subjects.
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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## Module Catalogue for the Subject
### Information Systems
#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>Business Software 2: Enterprise Resource Planning Systems</td>
<td>12-M-ERP-192-m01</td>
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<td>Faculty of Business Management and Economics</td>
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<tr>
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<td>graduate</td>
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## Contents

**Content:**
This module provides students with an overview of the structure of business information systems in width as well as the selection and implementation of business information systems in organisations.

**Outline of syllabus:**
1. Integrated information systems: integration, standard software, system architectures, operating models
2. Selection of integrated information systems: methods, cost-benefit analysis
3. Implementation of integrated information systems: project management, project organisation, project marketing

The lecture will be accompanied by an exercise that will present students with an opportunity to access, in small groups, the enterprise resource planning system operated by the Chair in its ERP laboratory and to work with the software, dealing with a wide variety of business processes.

## Intended learning outcomes
After completing the course “Business Software 2”, students will be able to
1. differentiate between system architectures and -philosophies;
2. understand the interaction of business processes;
3. come to a selection decision for an ERP system using a structured approach and compare different ERP systems;
4. execute business tasks and processes in an ERP system independently (after participation in the practice lessons).

## Courses

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of weekly contact hours, language — if other than German</th>
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<td>V</td>
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## Method of assessment

<table>
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<tr>
<td>c) Term paper (15 to 20 pages) or Creditable for bonus</td>
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Language of assessment: German and/or English
Assessment offered: Once a year, summer semester

## Allocation of places

20 places.
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Master’s students of Information Systems will be given preferential consideration.
(2) The remaining places will be allocated to students of other subjects.
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.
Additional information

Referred to in LPO I (examination regulations for teaching-degree programmes)
# Module Catalogue for the Subject Information Systems

## Master's with 1 major, 120 ECTS credits

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<td>Advanced Seminar: Enterprise Systems</td>
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## Contents

In this course, students will acquire important knowledge and skills that will enable them to prepare a well-structured term paper and to present the results of their work with the help of relevant topics in the fields of information systems and enterprise systems.

**Reading:**
will vary according to topic

## Intended learning outcomes

After completing the course “Enterprise Systems”, students will be able to
1. understand the fundamentals of scientific literature reviews;
2. integrate elaborated content in a scientific thesis;
3. create presentations independently.

## Courses

| S (2) |

**Method of assessment**

| type, number of weekly contact hours, language — if other than German |
| term paper (approx. 20 to 25 pages) and presentation (approx. 20 minutes), weighted 2:1 |

**Language of assessment:** German and/or English

## Allocation of places

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

## Additional information

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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Track 2: Business Analytics
(20 ECTS credits)
## Module Catalogue for the Subject

### Information Systems

#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
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<th>Abbreviation</th>
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<td>Decision Support Systems</td>
<td>12-M-DSS-192-m01</td>
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<td>1 semester</td>
<td>graduate</td>
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</table>

### Contents

The course discusses advanced approaches for modelling and solving decision problems in business settings. The acquired insights are used to design and implement decision support systems using standard software tools (Python).

### Intended learning outcomes

After successfully completing the course, students should be able to

- Understand the structure of classic business decision problems
- Isolate key elements from general problem descriptions and convert them to quantitative decision models
- Solve different classes of optimization problems (linear, network, integer, multi-objective, non-linear, stochastic)
- Implement decision support systems

### Courses

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<th>Type</th>
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### Method of assessment

a) Written examination (approx. 60 minutes) or
b) oral examination (one candidate each: approx. 10 to 15 minutes, groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes)

Creditable for bonus
Language of assessment: German and/or English

### Allocation of places

40 places.
Should the number of applications exceed the number of available places, places will be allocated as follows:

1. Master's students of Information Systems will be given preferential consideration.
2. The remaining places will be allocated to students of other subjects.
3. When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

### Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

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## Module title
Analytical Information Systems

## Abbreviation
12-BI-192-m01

## Module coordinator
Holder of the Chair of Business Analytics

## Module offered by
Faculty of Business Management and Economics

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<th>ECTS</th>
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## Duration
1 semester

## Module level
graduate

## Other prerequisites
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### Contents
The course provides an overview of the structure and applications of analytical information systems. A special focus is on individual quantitative methods of data analysis. On the one hand, methods from the areas of data preparation and data manipulation as well as their practical application are introduced. On the other hand, an introduction to methods and the application of machine learning methods for predictive analytics, in particular neural networks and deep learning, is given.

### Intended learning outcomes
The module provides students with knowledge of:
- Data Manipulation
- Data Engineering
- Descriptive Analytics
- Predictive Analytics and Data Mining
- Supervised Learning
- Unsupervised Learning
- Neural Networks and Deep Learning
- Text Mining
- Big Data Technologies

### Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Written examination (approx. 60 Minutes)
Creditable for bonus
Language of assessment: German and/or English

### Allocation of places
40 places.

WM1:
Should the number of applications exceed the number of available places, places will be allocated as follows:
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2) The remaining places will be allocated to students of other subjects.
3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

### Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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## Module title

### Business Analytics

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### Module coordinator

Holder of the Chair of Business Analytics

### Module offered by

Faculty of Business Management and Economics

### ECTS

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### Contents

In this course, students will acquire important knowledge and skills that will enable them to prepare a well-structured term paper and to present the results of their work with the help of relevant topics in the field of business management decision models and methods and their application in the development of decision-support systems as well as analytical information systems and quantitative methods of data analysis.

Students work on current topics using methods from machine learning, mathematical optimization and simulation.

### Intended learning outcomes

The module provides students with knowledge of:

- Scientific literature
- Implementation of methods in code
- Integration of developed results in scientific papers
- Creating presentations and lectures

### Courses

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### Method of assessment

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<tr>
<td>term paper (approx. 20 to 25 pages) and presentation (approx. 20 minutes), weighted 2:1</td>
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Assessment offered: Once a year, winter semester
Language of assessment: German and/or English

### Allocation of places

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Track 3: Electronic Business
(20 ECTS credits)
Module title: E-Business Strategies
Abbreviation: 12-M-IBS-192-m01

Module coordinator: Holder of the Chair of Information Systems Engineering
Module offered by: Faculty of Business Management and Economics

ECTS: 5
Method of grading: numerical grade
Duration: 1 semester
Module level: graduate
Other prerequisites: --

Contents:
The module provides an overview of strategic implications of digital technologies at the level of organisations, industries and value networks. To this end, concepts and frameworks from strategic technology management are applied to digital innovations and illustrated with numerous examples. In the accompanying exercise, case studies of well-known digital companies and their business models are analysed and discussed.

Intended learning outcomes:
- Understand theoretical concepts of strategy development and implementation in the context of digital technologies.
- Apply different frames of reference and understand their strengths and weaknesses in the context of practical application.
- Transfer the concepts to real business situations

Courses:
V (2) + Ü (2)

Method of assessment:
(a) Written examination (approx. 60 minutes) or
(b) oral examination (one candidate each: approx. 10 to 15 minutes, groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes) or
Creditable for bonus
Language of assessment: German and/or English

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes):
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<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Mobile and Ubiquitous Systems</td>
<td>12-M-MUS-161-m01</td>
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### Contents

The module provides an overview of technologies and business applications of mobile & ubiquitous computing. Concepts and applications are illustrated using numerous examples from mobile telecommunications to the Internet of Things. In the accompanying exercise, corresponding case study texts are analysed and discussed.

### Intended learning outcomes

- Understand the technological basics of mobile & ubiquitous computing.
- Analysing business applications in processes, products/services and business models
- Apply the concepts learned to real-life problems in a business context

### Courses

(type, number of weekly contact hours, language — if other than German)

Ü (2) + V (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) oral examination (one candidate each: approx. 15 to 20 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<td>Seminar: E-Business Strategies</td>
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**Contents**

In this course, students will acquire important knowledge and skills that will enable them to prepare a well-structured term paper and to present the results of their work with the help of relevant topics in the fields of web-based platforms (electronic markets, Web 2.0 etc.) and strategic management of a company.

**Intended learning outcomes**

- Academic literature review
- Integration of developed results in scientific papers
- Creating presentations and talks

**Courses** (type, number of weekly contact hours, language — if other than German)

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<th>Type</th>
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**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- Term paper (approx. 20 to 25 pages) and presentation (approx. 20 minutes), weighted 2:1
- Assessment offered: Once a year, winter semester
- Language of assessment: German and/or English

**Allocation of places**

- 20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

-  

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

-  
Track 4: Global Operations and Information Management
(20 ECTS credits)
# Corporate Entrepreneurship

**Abbreviation**

12-M-UGF1-182-m01

<table>
<thead>
<tr>
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<td>Corporate Entrepreneurship</td>
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**Module coordinator**

Holder of the Chair of Entrepreneurship and Strategy

**Module offered by**

Faculty of Business Management and Economics

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</table>

**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

## Contents

This module is a theory-led and practice-oriented primer on corporate entrepreneurship. It provides you with knowledge useful for anyone aiming at working (or researching) in the field of corporate innovation and entrepreneurship or at pursuing an 'intrapreneurial' or entrepreneurial career.

1. **Introduction to corporate entrepreneurship**
2. **Antecedents and forms of corporate entrepreneurship**
3. **Corporate strategy and corporate entrepreneurship**
4. **Organizational structure and corporate entrepreneurship**
5. **Human resource management and corporate entrepreneurship**
6. **Building supportive organizational cultures**
7. **Entrepreneurial control systems**
8. **Entrepreneurial leadership**
9. **The corporate entrepreneur as a champion and diplomat**
10. **The pay-off from corporate entrepreneurship**
11. **Corporate venture capital**
12. **Corporate entrepreneurship in nonprofit and government organizations**
13. **Universities and academic spin-offs**
14. **Wrap-up and Q&A**

## Intended learning outcomes

### Educational aims

- Clarify the role of corporate entrepreneurship
- Explain theoretical concepts and mechanisms behind corporate entrepreneurship
- Enable students to critically appraise alternative approaches to corporate entrepreneurship
- Enable students to evaluate the boundaries and risks of corporate entrepreneurship

### Learning outcomes

On successful completion of this module students will be able to:

- Create and evaluate concepts related to corporate entrepreneurship
- Assess the role of corporate entrepreneurship for creating and sustaining competitive advantage
- Make judgements about the organizational and managerial implications of corporate entrepreneurship
- Systematically choose between different routes of action
<table>
<thead>
<tr>
<th><strong>Courses</strong> (type, number of weekly contact hours, language — if other than German)</th>
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<tbody>
<tr>
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<td>Language of assessment: English</td>
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<tr>
<th><strong>Additional information</strong></th>
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</table>
Module title | Digital Entrepreneurship
---|---
Abbreviation | 12-M-UGF3-182-m01

Module coordinator | Holder of the Chair of Entrepreneurship and Strategy
Module offered by | Faculty of Business Management and Economics

| ECTS | 5 |
| Method of grading | numerical grade |
| Only after succ. compl. of module(s) | -- |

| Duration | 1 semester |
| Module level | graduate |
| Other prerequisites | -- |

Contents

Intended learning outcomes
Educational aims: Clarify the role of digital entrepreneurship and digital transformation. Explain theoretical concepts and mechanisms behind digital entrepreneurship and digital transformation. Enable students to critically appraise alternative approaches to digital entrepreneurship and digital transformation. Enable students to evaluate the boundaries and risks of digital entrepreneurship and digital transformation.

Learning outcomes: On successful completion of this module students will be able to (1) Assess the role of digital entrepreneurship and digital transformation for creating and sustaining competitive advantage, (2) Create and evaluate concepts related to digital entrepreneurship and digital transformation, (3) Make judgements about the organizational and managerial implications of digital entrepreneurship and digital transformation, (4) Systematically choose between different routes of action.

Courses
V (2) + Ü (2) Module taught in: English

Method of assessment
a) written examination (approx. 60 to 120 minutes) or b) log (15 to 20 pages) or c) oral examination (one candidate each: approx. 10 to 15 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes) Language of assessment: English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
--
# Advanced Seminar: Entrepreneurship and Management

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<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Advanced Seminar: Entrepreneurship and Management</td>
<td>12-M-SAS-182-m01</td>
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## Module coordinator
Holder of the Chair of Entrepreneurship and Strategy

## Module offered by
Faculty of Business Management and Economics

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## Duration
1 semester

## Graduation level
graduate

## Other prerequisites
--

### Contents
Students develop seminar papers on varying topics in the domain of entrepreneurship, strategy, and innovation and present the key insights from their work.

### Intended learning outcomes

#### Educational aims
- Enable students to position their research
- Enable students to critically review a substantial body of literature in short time
- Enable students to develop a sound theoretical framework
- Enable students to create a research paper fully meeting academic standards

#### Learning outcomes
On successful completion of this module students will be able to:
- Differentiate their research from previous work
- Adopt theoretical perspectives to understand complex phenomena
- Engage in comprehensive academic reasoning
- Articulate abstract and complex phenomena and relationships in written and oral form

### Courses
##### (type, number of weekly contact hours, language — if other than German)

<table>
<thead>
<tr>
<th>Type</th>
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### Method of assessment
##### (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Term paper (approx. 20 pages) and presentation (15 to 30 minutes), weighted 2:1

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English

### Allocation of places
20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

### Additional information
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### Referred to in LPO I
( examination regulations for teaching-degree programmes)

--
Track 5: Operations Management
(20 ECTS credits)
Module title | Abbreviation
---|---
Global Logistics & Supply Chain Management | 12-M-GLSC-182-m01

Module coordinator | Module offered by
Holder of the Chair of Logistics and Quantitative Methods in Business Administration | Faculty of Business Management and Economics

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</table>

Contents
The course "Global Logistics & Supply Chain Management" acquaints students with advanced methods for the planning of global production networks and demonstrates the application of these with the help of multiple case studies.

Intended learning outcomes
After completing this course students can
(i) analyze and evaluate global production networks;
(ii) develop and apply appropriate methods to plan production networks;
(iii) evaluate the consequences of uncertainties in processes and apply concepts and methods to plan uncertain processes.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)
Module taught in: English

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 60 minutes) or b) term paper (approx. 15 to 20 pages)
Language of assessment: English
creditable for bonus

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Advanced Operations &amp; Logistics Management</td>
<td>12-M-AOLM-182-m01</td>
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<tbody>
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<td>Holder of the Chair of Logistics and Quantitative Methods in Business Administration</td>
<td>Faculty of Business Management and Economics</td>
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</table>

**Contents**

The course "Advanced Operations & Logistics Management" acquaints students with advanced methods for the planning of integrated production and logistics systems and demonstrates the application of these with the help of multiple case studies.

**Intended learning outcomes**

After completing this course students can
(i) analyze and evaluate integrated production and logistics systems;
(ii) develop and apply appropriate methods to plan complex production and logistics systems;
(iii) evaluate the consequences of uncertainties in processes, and
(iv) apply concepts and methods to plan uncertainties processes.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)  
Module taught in: English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 to 20 pages)  
Language of assessment: English  
Creditable for bonus: --

**Allocation of places**

--

**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
### Module title
Seminar: Operations Management

### Abbreviation
12-M-SN-161-m01

### Module coordinator
Holder of the Chair of Business Management and Business Information Systems

### Module offered by
Faculty of Business Management and Economics

### ECTS
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### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
With the help of topics from the area of "Operations Management", this course will provide students with knowledge and skills that will enable them to prepare a well-structured term paper and to present the key results of their work.

### Intended learning outcomes
Students will learn how to convince a critical audience by giving a presentation regarding a topic from the area of Operations Management. By developing and giving a presentation as well as by answering questions the students will practice their skills to deal with difficult communication situations and to argue for and against a certain topic.

### Courses (type, number of weekly contact hours, language — if other than German)
S (2)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- term paper (approx. 20 to 25 pages) and presentation (approx. 20 minutes), weighted 2:1
- Assessment offered: Once a year, winter semester
- Language of assessment: German and/or English

### Allocation of places
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### Additional information
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### Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Compulsory Electives III: Electives
(15 ECTS credits)
Module title | Abbreviation
--- | ---
Adaption and Continuous System Engineering | 12-ACSE-161-m01

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</table>

Duration | Module level | Other prerequisites |
--- | --- | --- |
1 semester | graduate | -- |

Contents

Business Suite: The constantly changing environment with its organisational and IT-oriented developments forces companies to adapt their standard business software solutions. With the help of dynamic adaptation (Continuous System Engineering), this process of change can be supported effectively and efficiently. This module discusses both the systematic implementation of adaptation steps (so-called customising) using the example of the mySAP Business Suite and the concept of Continuous System Engineering using various practical examples. Business Apps: The course combines theory and practice in the area of cloud computing and ERP. Participants gain an insight into the architecture of the ByDesign platform and are presented with an opportunity to gain practical experience working with the corresponding software development kit.

Content:
- Fundamentals of cloud computing
- Cloud business solutions
- Architecture of the SAP Business ByDesign platform
- Platform adaptation and extensibility
- Basics of software development in SAP Cloud Applications Studio
- Hands-on SDK: independently designing and developing a demo app

Intended learning outcomes

Business Suite: Students learn about the various ways of adapting a standard business software solution to the special requirements of a company. They also develop a fundamental understanding of the dynamic adaptation of business software libraries. Based on selected examples from the SAP Business Suite that the acquired knowledge will be deepened by using case studies. Business Apps: The course imparts knowledge and delivers skills in cloud computing for businesses, ERP systems architecture and software development at the example of the SAP Business ByDesign platform. The independent planning, implementation and documentation of a business app trains important core competencies of technology-oriented Business Informatics.

Courses (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 20 pages) or c) oral examination (one candidate each: approx. 10 to 15 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)
Language of assessment: German and/or English creditable for bonus

Allocation of places

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)

---
### Module title

**Business Service Platforms 2**

### Abbreviation

12-AGP2-192-m01

### Module coordinator

**Holder of the Chair of Business Management and Business Information Systems**

### Module offered by

**Faculty of Business Management and Economics**

<table>
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<tr>
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</table>

### Duration

1 semester  

### Module level

graduate

### Other prerequisites

--

### Contents

The next generation of business service platforms leads to a transformation of traditional industrial enterprises into service businesses that generate a large proportion of value in developed economies. New ICT technologies such as cloud computing, the Internet of Things and semantic technologies will contribute to the success of these businesses in a similar way as ERP contributed to the success of industrial enterprises. But we are still at the beginning of the evolution of business service platforms, which will have to become more adaptable to support special business models and allow differentiating customer service processes.

The course will discuss different case studies on services businesses. The digital transformation of the software industry into a service industry is the most prominent of these cases.

### Intended learning outcomes

Be aware of the growing economic importance of the service sector. Understand that services businesses in are facing a special productivity problem, which could not be addressed by the same processes applied in the manufacturing industries. Understand the new ICT technologies we have at hand today to deliver smart solutions for this problem. Be aware of the diversity of services business today where we have no evidence that a general standard can be found applicable to most subsectors similar to the standardization achieved for the manufacturing industries after twenty years of research.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Written examination (approx. 60 minutes)  
Creditable for bonus  
Language of assessment: German and/or English

### Allocation of places

40 places.  
Should the number of applications exceed the number of available places, places will be allocated as follows:  
(1) Master’s students of Information Systems will be given preferential consideration.  
(2) The remaining places will be allocated to students of other subjects.  
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title: Business Service Platforms 1  
Abbreviation: 12-BSA-192-m01

Module coordinator: Holder of the Chair of Business Management and Business Information Systems

Module offered by: Faculty of Business Management and Economics

ECTS: 5  
Method of grading: numerical grade  
Only after succ. compl. of module(s): --

Duration: 1 semester  
Module level: graduate  
Other prerequisites: --

Contents:
A next generation of enterprise systems called business service platforms is emerging using new disruptive technologies such as cloud computing, big data and mobility. These business service platforms apply the concept of product platforms to software. They will
1. be services based
2. be offered as a service in the cloud
3. address new classes of users and types of business especially in the service business
4. allow for a high degree of business adaptability and extensibility.
5. be supplemented by a broad offer of partner add-ons supporting accelerated innovation.

These new business service platforms will play a key role in the digital transformation of the software industry.

Intended learning outcomes:
Be aware of the big business productivity progress enabled by BIS in the last 50 years. Understand the limitations of these systems in spite of the digital transformation of the software industry ahead. Be able to critically assess the business potential of new IC technologies. Understand the business demand for change. Understand the necessary organizational learning needed to leverage new technology for business change management.

Courses:
(type, number of weekly contact hours, language — if other than German)
V (2)

Method of assessment:
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Written examination (approx. 60 minutes)  
Creditable for bonus  
Language of assessment: German and/or English

Allocation of places:
40 places.  
Should the number of applications exceed the number of available places, places will be allocated as follows:  
(1) Master’s students of Information Systems will be given preferential consideration.  
(2) The remaining places will be allocated to students of other subjects.  
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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**Module title**  

<table>
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<th>Abbreviation</th>
<th>12-GLP-161-m01</th>
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**Module coordinator**  
holder of the Chair of Business Management and Business Information Systems

**Module offered by**  
Faculty of Business Management and Economics

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</table>

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
--

**Contents**

ERP systems have become key elements of successful companies. Business processes in companies can no longer be managed without using such ERP systems. In financial departments of companies, such systems have been used for a long time, but business processes e. g. for logistical tasks have so far not been supported by ERP solutions. This module explains how this issue could be resolved as well as what constraints and what dependencies have to be considered.

**Intended learning outcomes**

After completing this module, students should be able to

(i) know about actual business processes in companies;
(ii) understand selected problems in the organization and design of logistical business processes and work out solutions;
(iii) know and design basic data structures and data flows of an ERP system;
(iv) map business processes within an ERP system;
(v) consider the specifics of a certain industry (e. g. the process industry) when organizing business processes;
(vi) map the core business processes within an ERP system.

**Courses**

| (type, number of weekly contact hours, language — if other than German) |
| V (2) + Ü (2) |

**Method of assessment**

| (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus) |
| written examination (approx. 60 minutes) |
| Language of assessment: German and/or English |
| creditable for bonus |

**Allocation of places**

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
Work and Information  12-ITA-161-m01

Module coordinator
holder of the Chair of Business Management and Business Information Systems

Module offered by
Faculty of Business Management and Economics

ECTS | Method of grading | Only after succ. compl. of module(s)
--- | --- | ---
5 | numerical grade | --

Duration | Module level | Other prerequisites
1 semester | graduate | --

Contents
This module discusses relevant principles, concepts and applications of business information processing and its impact on organisational and process structures in today’s business world.

Intended learning outcomes
The expertise gained from other modules related to business management issues can be interpreted and classified in a certain way by participating in this module. For decisions in regards to human resources planning, investment, and a company’s strategy, the students will get to know all the relevant concepts and interdependencies, which come with taking information processing into account as the so called “fourth” factor of production.

Courses (type, number of weekly contact hours, language — if other than German)
V (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 60 minutes) or b) oral examination (one candidate each: approx. 15 to 20 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)
Language of assessment: German and/or English

Allocation of places
--

Additional information
--

Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title | Abbreviation
---|---
Work Order Planning for Automated Manufacturing | 12-M-AGAF-161-m01

Module coordinator | Module offered by
Holder of the Chair of Business Management and Business Information Systems | Faculty of Business Management and Economics

ECTS | Method of grading | Only after succ. compl. of module(s)
5 | numerical grade | --

Duration | Module level | Other prerequisites
1 semester | graduate | --

Contents
The idea of integration of business information systems is primarily practiced and developed as an ERP system in terms of business application areas, their temporal overlap (data warehouse), their spatial relationship (supply network) and connection of legal tasks (eGovernment). However, linking the commercial view of incoming customer orders with the logistic or more technical view of the scheduling of production orders and the resulting consequences for the processes is a critical success factor.

Intended learning outcomes
Linking research and lectures of the Institute of Robotics and Telematics as well as the orientation of the Chair of Business Integration allows students a conceptual as well as practical insight into the challenges of this in the future essential part of the operational automation development.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 minutes)
Language of assessment: German and/or English

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Module Catalogue for the Subject Information Systems

**Master's with 1 major, 120 ECTS credits**

<table>
<thead>
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<td>Topics in Business Information Systems 1</td>
<td>12-M-ATW1-161-m01</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

### Contents

This course is a dummy module, e.g. for courses in the area of business informatics taken abroad.

### Intended learning outcomes

The competences depend on the individual module, which has been taken to transfer these credits to the University of Wuerzburg.

### Courses

(type, number of weekly contact hours, language — if other than German)

- V (2) + Ü (2)
  - Course type: alternatively S instead of V + Ü

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- a) written examination (approx. 60 minutes) or b) presentation (15 to 20 minutes) and written elaboration (approx. 20 pages), weighted 1:2 or c) oral examination (one candidate each: approx. 10 to 15 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)
- Language of assessment: German and/or English credited for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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</thead>
<tbody>
<tr>
<td>Topics in Business Information Systems 2</td>
<td>12-M-ATW2-161-m01</td>
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</tbody>
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<table>
<thead>
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<th>Module coordinator</th>
<th>Module offered by</th>
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<tbody>
<tr>
<td>Holder of the Chair of Business Management and Business Information Systems</td>
<td>Faculty of Business Management and Economics</td>
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<tbody>
<tr>
<td>1 semester</td>
<td>graduate</td>
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</table>

**Contents**

This course is a dummy module, e.g. for courses in the area of business informatics taken abroad.

**Intended learning outcomes**

The competences depend on the individual module, which has been taken to transfer these credits to the University of Wuerzburg.

**Courses** (type, number of weekly contact hours, language — if other than German)

- V (2) + Ü (2)
  - Course type: alternatively S instead of V + Ü

**Method of assessment** (type, scope, language — if other than German; examination offered — if not every semester, information on whether module is creditable for bonus)

- a) written examination (approx. 60 minutes) or b) presentation (15 to 20 minutes) and written elaboration (approx. 20 pages), weighted 1:2 or c) oral examination (one candidate each: approx. 10 to 15 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)
  - Language of assessment: German and/or English
  - Creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
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Information systems research | 12-M-ISR-192-m01

Module coordinator | Module offered by
Holder of the Chair of Business Management and Business Information Systems | Faculty of Business Management and Economics

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Contents
The course provides an overview of theoretical scientific foundations, theories, research topics and methods of international research in business informatics.

Intended learning outcomes
The module provides students with knowledge of:
(i) Exploration of classical themes of WI / IS research;
(ii) Getting to know the relevant paradigms, theories and methods;
(iii) Recognition of the interfaces to other areas of business administration and management practice;
(iv) Gain experience in finding and evaluation of scientific literature

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) Written examination (approx. 60 minutes) or
b) oral examination (one candidate each: approx. 15 to 20 minutes, groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes)
Creditable for bonus
Language of assessment: German and/or English

Allocation of places
40 places.
Should the number of applications exceed the number of available places, places will be allocated as follows:
(1) Master’s students of Information Systems will be given preferential consideration.
(2) The remaining places will be allocated to students of other subjects.
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
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<td>Databases 2</td>
<td>10-I=DB2-161-m01</td>
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</table>

**Contents**

Data warehouses and data mining; web databases; introduction to Datalog.

**Intended learning outcomes**

The students have advanced knowledge about relational databases, XML and data mining.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IS, HCI.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
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<tr>
<td>Compiler Construction</td>
<td>10-I=CB-161-m01</td>
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</table>

**Contents**

Lexical analysis, syntactic analysis, semantics, compiler generators, code generators, code optimisation.

**Intended learning outcomes**

The students possess knowledge in the formal description of programming languages and their compilation. They are able to perform transformations between them with the help of finite automata, push-down automata and compiler generators.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IT, IS, GE

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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## Module Catalogue for the Subject
### Information Systems
#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Information Retrieval</td>
<td>10-I=IR-161-m01</td>
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### Contents
IR models (e. g. Boolean and vector space model, evaluation), processing of text (tokenising, text properties), data structures (e. g. inverted index), query elements (e. g. query operations, relevance feedback, query languages and paradigms, structured queries), search engine (e. g. architecture, crawling, interfaces, link analysis), methods to support IR (e. g. recommendation systems, text clustering and classification, information extraction).

### Intended learning outcomes
The students possess theoretical and practical knowledge in the area of information retrieval and have acquired the technical know-how to create a search engine.

### Courses
(V (2) + Ü (2))

### Method of assessment
Written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

### Allocation of places
--

### Additional information
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits):
IT, IS, HCI, GE

### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Artificial Intelligence 1</td>
<td>10-I=KI1-161-m01</td>
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**Module coordinator**
holder of the Chair of Computer Science VI

**Module offered by**
Institute of Computer Science

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**Duration**
1 semester

**Module level**
graduate

**Other prerequisites**
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**Contents**
Intelligent agents, uninformed and heuristic search, constraint problem solving, search with partial information, propositional and predicate logic and inference, knowledge representation.

**Intended learning outcomes**
The students possess theoretical and practical knowledge about artificial intelligence in the area of agents, search and logic and are able to assess possible applications.

**Courses**
(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

**Allocation of places**
--

**Additional information**
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IS, HCI

**Referred to in LPO I**
(examination regulations for teaching-degree programmes)

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### Artificial Intelligence 2

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<td>Artificial Intelligence 2</td>
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</table>

### Contents

Planning, probabilistic closure and Bayesian networks, utility theory and decidability problems, learning from observations, knowledge while learning, neural networks and statistical learning methods, reinforcement learning, processing of natural language.

### Intended learning outcomes

The students possess theoretical and practical knowledge about artificial intelligence in the area of probabilistic closure, learning and language processing and are able to assess possible applications.

### Courses

**(type, number of weekly contact hours, language — if other than German)**

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<thead>
<tr>
<th>Type</th>
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<th>Language</th>
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### Allocation of places

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### Additional information

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):

AT, SE, IS, HCI, GE

**Referred to in LPO I** *(examination regulations for teaching-degree programmes)*

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<td>E-Learning</td>
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</table>

**Contents**

Learning paradigms, learning system types, author systems, learning platforms, standards for learning systems, intelligent tutoring systems, student models, didactics, problem-oriented learning and case-based training systems, adaptive tutoring systems, computer-supported cooperative learning, evaluation of learning systems.

**Intended learning outcomes**

The students possess a theoretical and practical knowledge about eLearning and are able to assess possible applications.

**Courses**

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):
SE, IT, IS, HCI, GE

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

--
## Module title
Analysis and Design of Programs

## Abbreviation
10-I-PA-161-m01

## Module coordinator
holder of the Chair of Computer Science II

## Module offered by
Institute of Computer Science

## ECTS
5

## Method of grading
numerical grade

## Only after succ. compl. of module(s)
--

## Duration
1 semester

## Module level
graduate

## Other prerequisites
--

## Contents
Program analysis, model creation in software engineering, program quality, test of programs, process models.

## Intended learning outcomes
The students are able to analyse programs, to use testing frameworks and metrics as well as to judge program quality.

## Courses
(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

## Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

## Allocation of places
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## Additional information
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):
SE,IS,ES,GE

## Referred to in LPO I
(examination regulations for teaching-degree programmes)
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Module title | Abbreviation
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Professional Project Management | 10-I=PM-182-m01

Module coordinator | Module offered by
holder of the Chair of Computer Science III | Institute of Computer Science

<table>
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Duration | Module level | Other prerequisites
1 semester | graduate | Simultaneous completion of module 10-I=PRJAK is recommended.

Contents

Project goals, project assignment, project success criteria, business plan, environment analysis and stakeholder management, initialisation, definition, planning, execution/control, finishing of projects, reporting, project communication and marketing, project organisation, team building and development, opportunity and risk management; conflict and crisis management, change and claim management; contract and procurement management, quality management, work techniques, methods and tools; leadership and social skills in project management, program management, multiproject management, project portfolio management, PMOs; peculiarities of software projects; agile project management/SCRUM, combination of classic and agile methods.

Intended learning outcomes

The students possess practically relevant knowledge about the topics of production management and/or professional project management. They are familiar with the critical success criteria and are able to initiate, define, plan, control and review projects.

Courses (type, number of weekly contact hours, language — if other than German)

V (4)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IT, IS, ES, LR, HCI, GE.

Referred to in LPO I (examination regulations for teaching-degree programmes)

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<table>
<thead>
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<td>Algorithms for Geographic Information Systems</td>
<td>10-I=AGIS-161-m01</td>
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### Contents

Algorithmic foundations of geographic information systems and their application in selected problems of acquisition, processing, analysis and presentation of spatial information. Processes of discrete and continuous optimisation. Applications such as the creation of digital height models, working with GPS trajectories, tasks of spatial planning as well as cartographic generalisation.

### Intended learning outcomes

The students are able to formalise algorithmic problems in the field of geographic information systems as well as to select and improve suitable approaches to solving these problems.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): AT, IS, HCI

Referred to in LPO I (examination regulations for teaching-degree programmes)

--
Module title: Real-Time Interactive Systems  
Abbreviation: 10-HCI=RIS-182-m01

Module coordinator: holder of the Chair of Computer Science IX  
Module offered by: Institute of Computer Science

ECTS: 5  
Method of grading: numerical grade  
Duration: 1 semester  
Module level: graduate  
Other prerequisites: --

Contents
This course provides an introduction into the requirements, concepts, and engineering art of highly interactive human-computer systems. Such systems are typically found in perceptual computing, Virtual, Augmented, Mixed Reality, computer games, and cyber-physical systems. Lately, these systems are often termed Real-Time Interactive Systems (RIS) due to their common aspects.

The course covers theoretical models derived from the requirements of the application area as well as common hands-on and novel solutions necessary to tackle and fulfill these requirements. The first part of the course will concentrate on the conceptual principles characterizing real-time interactive systems. Questions answered are: What are the main requirements? How do we handle multiple modalities? How do we define the timeliness of RIS? Why is it important? What do we have to do to assure timeliness? The second part will introduce a conceptual model of the mission-critical aspects of time, latencies, processes, and events necessary to describe a system's behavior. The third part introduces the application state, it's requirements of distribution and coherence, and the consequences these requirements have on decoupling and software quality aspects in general. The last part introduces some potential solutions to data redundancy, distribution, synchronization, and interoperability. Along the way, typical and prominent state-of-the-art approaches to recurring engineering tasks are discussed. This includes pipeline systems, scene graphs, application graphs (aka field routing), event systems, entity and component models, and others. Novel concepts like actor models and ontologies will be covered as alternative solutions. The theoretical and conceptual discussions will be put into a practical context of today's commercial and research systems, e.g., X3D, instant reality, Unity3d, Unreal Engine 4, and Simulator X.

Intended learning outcomes
After the course, the students will have a solid understanding of the boundary conditions defined by both, the physiological and psychological characteristics of the human users as well as by the architectures and technological characteristics of today's computer systems. Participants will gain a solid understanding about what they can expect from today's technological solutions. They will be able to choose the appropriate approach and tools to solve a given engineering task in this application area and they will have a well-founded basis enabling them to develop alternative approaches for future real-time interactive systems.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

Allocation of places
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Additional information
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): HCI.
Cf. Section 3 Subsection 3 Sentence 8 FSB (subject-specific provisions).
**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module title

<table>
<thead>
<tr>
<th>Logic Programming</th>
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<td>10-I=LP-172-m01</td>
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### Module coordinator

| holder of the Chair of Computer Science I |
| Institute of Computer Science |

### ECTS

| 5 |

### Method of grading

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### Duration

| 1 semester |

### Module level

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<tr>
<th>graduate</th>
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### Other prerequisites

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### Contents

Logic-relational programming paradigm, top-down evaluation with SLD(NF) resolution. Introduction to the logic programming language Prolog: recursion, predicate-oriented programming, backtracking, cut, side effects, aggregations. Connection to (deductive) databases. Comparison with Datalog, short introduction of advanced concepts like constraint logic programming.

### Intended learning outcomes

The students have fundamental and practicable knowledge of logic programming. They are able to implement compact and declarative programs in Prolog, and to compare this approach to the traditional imperative programming paradigm.

### Courses

| type, number of weekly contact hours, language — if other than German |
| V (2) + Ü (2) |

### Method of assessment

| type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus |
| written examination (approx. 60 to 120 minutes). |
| If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). |
| Language of assessment: German and/or English |
| creditable for bonus |

### Allocation of places

| -- |

### Additional information

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<tr>
<td>Machine Learning for Natural Language Processing</td>
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<td>1 semester</td>
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**Contents**

The lecture conveys advanced knowledge about methods in computational text processing. To this end, it presents state of the art models and techniques in the area of machine learning, as well as their technical background, and their respective applications in Natural Language Processing. As one important building block of almost all modern NLP-models, different techniques for learning representations of words, so called Word Embeddings, are presented. Starting from this we cover, among others, models from the area of Deep Learning, like CNNs, RNNs and Sequence-to-Sequence architectures. The theoretical foundations of these models, like their training with Backpropagation, are also covered in depth. For all models presented in the lecture, we show their application to problems like sentiment analysis, text generation and machine translation in practice.

**Intended learning outcomes**

The participants have solid knowledge on problems and methods in the area of computational text processing and are able to identify and apply suitable methods for a specific task.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): AT, IS, HCI.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module title

**Medical Informatics**

### Abbreviation

10-I=MI-161-m01

### Module coordinator

holder of the Chair of Computer Science VI

### Module offered by

Institute of Computer Science

### ECTS

5

### Method of grading

numerical grade

### Only after succ. compl. of module(s)

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### Duration

1 semester

### Module level

graduate

### Other prerequisites

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### Contents

Electronic patient folder, coding of medical data, hospital information systems, operation of computers in infirmary and functional units, medical decision making and assistance systems, statistics and data mining in medical research, case-based training systems in medical training.

### Intended learning outcomes

The students possess theoretical and practical knowledge about the application of computer science methods in medicine.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Written examination (approx. 60 to 120 minutes).

If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IT, IS, HCI, GE

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title
Performance Engineering & Benchmarking of Computer Systems

Abbreviation
10-I=PEB-161-m01

Module coordinator
holder of the Chair of Computer Science II

Module offered by
Institute of Computer Science

ECTS
5

Method of grading
numerical grade

Only after succ. compl. of module(s)
-

Duration
1 semester

Module level
graduate

Other prerequisites
-

Contents
Introduction to performance engineering of commercial software systems, performance measurement techniques, benchmarking of commercial software systems, modelling for performance prediction, case studies.

Intended learning outcomes
The students possess a fundamental and applicable knowledge in the areas of performance metrics, measurement techniques, multi-factorial variance analysis, data analysis with R, benchmark approaches, modelling with queue networks, modelling methods, resource demand approximation, petri nets.

Courses
(type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English
creditable for bonus

Allocation of places
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Additional information
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):
SE, IT, ES, HCI, GE

Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<td>Programming with neural nets</td>
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</table>

### Contents
Overview over NN, implementation of important NN-architectures like FCN, CNN and LSTMs, practical example for NN-architectures, among others in the area of image and language processing.

### Intended learning outcomes
Knowledge about possible applications and limitations of NN, for important architectures (eg. FCN, CNN, LSTM) and how they are implemented in NN-tools like Tensorflow/Keras, ability to program network structures from literature, to prepare data and solve concrete tasks for NN.

### Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
Written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

### Allocation of places
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### Additional information
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IT, IS, HCI, GE.

### Referred to in LPO I (examination regulations for teaching-degree programmes)
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### Module title
Robotics 1

### Abbreviation
10-I=RO1-182-m01

### Module coordinator
holder of the Chair of Computer Science VII

### Module offered by
Institute of Computer Science

### ECTS
8

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
- History, applications and properties of robots, direct kinematics of manipulators: coordinate systems, rotations, homogenous coordinates, axis coordinates, arm equation. Inverse kinematics: solution properties, end effector configuration, numerical and analytical approaches, examples of different robots for analytical approaches.
- Workspace analysis and trajectory planning, dynamics of manipulators: Lagrange-Euler model, direct and inverse dynamics.
- Mobile robots: direct and inverse kinematics, propulsion system, tricycle, Ackermann steering, holonomic and non-holonomic restrictions, kinematic classification of mobile robots, posture kinematic model.
- Movement control and path planning: roadmap methods, cell decomposition methods, potential field methods.
- Sensors: position sensors, speed sensors, distance sensors.

### Intended learning outcomes
The students master the fundamentals of robot manipulators and vehicles and are, in particular, familiar with their kinematics and dynamics as well as the planning of paths and task execution.

### Courses
- V (4) + Ü (2)
  - Module taught in: English

### Method of assessment
- written examination (approx. 60 to 90 minutes)
  - Separate written examination for Master's students.
  - Language of assessment: English

### Allocation of places
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### Additional information
- Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): IS, ES, LR, HCI, GE.
- Referred to in LPO I (examination regulations for teaching-degree programmes)
Module title: Security of Software Systems
Abbreviation: 10-I=SSS-172-m01

Module coordinator: holder of the Chair of Computer Science II
Module offered by: Institute of Computer Science

ECTS: 5
Method of grading: numerical grade
Only after succ. compl. of module(s): --

Duration: 1 semester
Module level: graduate
Other prerequisites: --

Contents:
The lecture provides an overview of common software vulnerabilities, state-of-the-art attack techniques on modern computer systems, as well as the measures implemented to protect against these attacks. In the course, the following topics are discussed:
- x86-64 instruction set architecture and assembly language
- Runtime attacks (code injection, code reuse, defenses)
- Web security
- Blockchains and smart contracts
- Side-channel attacks
- Hardware security

Intended learning outcomes:
Students gain a deep understanding of software security, from hardware and low-level attacks to modern concepts such as blockchains. The lecture prepares for research in the area of security and privacy, while the exercises allow students to gain hands-on experience with attacks and analysis of systems from an attacker's perspective.

Courses:
(type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)
Module taught in: English

Method of assessment:
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: English
creditable for bonus

Allocation of places:
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Additional information:
Focuses available for students of the Master's programme Informatik (Computer Science, 120 ECTS credits): SE, IS, LR, HCI, ES.
Basic programming knowledge in C is required.

Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module title | Discrete Event Simulation
---|---
Abbreviation | 10-I=ST-161-m01

Module coordinator | holder of the Chair of Computer Science III
Module offered by | Institute of Computer Science

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<td>1 semester</td>
<td>graduate</td>
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</table>

Contents

Introduction to simulation techniques, statistical groundwork, creation of random numbers and random variables, random sample theory and estimation techniques, statistical analysis of simulation values, inspection of measured data, planning and evaluation of simulation experiments, special random processes, possibilities and limits of model creation and simulation, advanced concepts and techniques, practical execution of simulation projects.

Intended learning outcomes

The students possess the methodic knowledge and the practical skills necessary for the stochastic simulation of (technical) systems, the evaluation of results and the correct assessment of the possibilities and limits of simulation methods.

Courses (type, number of weekly contact hours, language — if other than German)

V (4) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English creditable for bonus

Allocation of places

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Additional information

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits):
IT,IS,ES,GE

Referred to in LPO I (examination regulations for teaching-degree programmes)

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### Module: Software Architecture

**Module title:** Software Architecture  
**Abbreviation:** 10-I=SAR-161-m01

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**Module coordinator:** holder of the Chair of Computer Science II  
**Module offered by:** Institute of Computer Science

**Module level:** graduate  
**Duration:** 1 semester

**Contents:**  
Current topics in the area of aerospace.

**Intended learning outcomes:**  
The students possess a fundamental and applicable knowledge about advanced topics in software engineering with a focus on modern software architectures and fundamental approaches to model-driven software engineering.

**Courses** (type, number of weekly contact hours, language — if other than German)  
V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)  
written examination (approx. 60 to 120 minutes).  
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).  
Language of assessment: German and/or English  
creditable for bonus

**Allocation of places**  
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**Additional information**  
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): SE, IT, ES

**Referred to in LPO I** (examination regulations for teaching-degree programmes)  
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<table>
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<td>NLP and Text Mining</td>
<td>10-I=STM-162-m01</td>
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**Contents**

Foundations in the following areas: definition of NLP and text mining, properties of text, sentence boundary detection, tokenisation, collocation, N-gram models, morphology, hidden Markov models for tagging, probabilistic parsing, word sense disambiguation, term extraction methods, information extraction, sentiment analysis. The students possess theoretical and practical knowledge about typical methods and algorithms in the area of text mining and language processing mostly for English. They are able to solve problems through the methods taught. They have gained experience in the application of text mining algorithms.

**Intended learning outcomes**

The students possess theoretical and practical knowledge about typical methods and algorithms in the area of text mining and language processing. They are able to solve practical problems with the methods acquired in class. They have gained experience in the application of text mining algorithms.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 to 120 minutes).
If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).
Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): AT, IT, HCI.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<td>Project - Current Topics in Computer Science</td>
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**Contents**
Completion of a project task (in Teams).

**Intended learning outcomes**
The project allows participants to work on a problem in computer science in teams.

**Courses** (type, number of weekly contact hours, language — if other than German)

P (4)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Project report (10 to 15 pages) and presentation of project (15 to 30 minutes)
Each project is offered one time only. The project will not be repeated; there will not be another project with the same topic. Assessment can, therefore, only be offered for the project offered in the respective semester. Assessment offered: In the semester in which the course is offered
Language of assessment: German and/or English

**Allocation of places**
--

**Additional information**
Focuses available for students of the Master’s programme Informatik (Computer Science, 120 ECTS credits): AT, SE, IT, IS, ES, LR, HCI, GE.

**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
International Marketing

Module title
International Marketing

Abbreviation
12-M-I MM-161-m01

Module coordinator
Holder of the Chair of Business Management and Marketing

Module offered by
Faculty of Business Management and Economics

ECTS
5

Method of grading
numerical grade

Only after succ. compl. of module(s)
--

Duration
1 semester

Module level
graduate

Other prerequisites
--

Contents

Description:
The module builds on the knowledge acquired during the Bachelor's degree programme or the Grundstudium (stage 1 studies). It provides a systematic introduction to strategic marketing decisions in global and international contexts. These are explained mainly by Porter’s diamond and cluster models. Another focus is on internationalisation strategies, which require country analyses and decisions on the selection of national markets as well as a timing of the countries market development. In addition, the module discusses different strategies for market entry and market development.

Outline of syllabus:
1. Internationalisation of the economy and regional integration processes
   - Globalisation
   - Competitiveness of countries, industries and companies in an international context
2. International strategic marketing decisions
   - Market entry forms
   - Market development strategies
   - Timing strategies
   - International organisation structures
3. Theories and strategies of internationalisation
   - Foreign trade theory
   - Multinational enterprise
   - Internationalisation strategies

Reading:

Intended learning outcomes

Students acquire in-depth skills in the field of strategic and operational management with particular attention to the international context. Students achieve particular expertise in the analysis, assessment and implementation of international business decisions and gain skills thus guiding the execution of marketing and management positions in globally-active companies.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 minutes)
Language of assessment: German and/or English

Allocation of places
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### Additional information

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<td>Brand Management &amp; Market Research</td>
<td>12-M-MM-161-m01</td>
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<th>Module level</th>
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<tr>
<td>1 semester</td>
<td>graduate</td>
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### Contents

**Description:**
At the beginning of the 21st century, marketing - until then interpreted as a market-oriented corporate management approach - was further developed to be seen as the entrepreneurial task of creating "shared value" for the organisation on the one hand and - broadly speaking - for society on the other hand. This idea leads to high requirements regarding the strategic sustainable positioning of the brand as well as brand management itself.

**Outline of syllabus:**
1. Brand leadership and brand assessment
2. Brand leadership, identity and relevance according to David Aaker’s approach
3. Brand strategies
4. Consumer behaviour
5. Market research methods and the development of brand strategies
6. Market research methods

**Intended learning outcomes**
Based on the theories of Meffert and Aaker, students will gain a profound understanding for brand leadership, which will be deepened by many practical implications and examples. Provided by cases studies and market research tools, it’s the defined goal of this lecture to convey an in-depth knowledge for consumer behavior and sustainable brand management.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx. 60 minutes)
Language of assessment: German and/or English

**Allocation of places**
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**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
--
Module title | Abbreviation
---|---
Strategic Networks in Industry | 12-M-MS-161-m01

Module coordinator | Module offered by
---|---
Holder of the Chair of Business Management and Marketing | Faculty of Business Management and Economics

ECTS | Method of grading | Only after succ. compl. of module(s)
---|---|---
5 | numerical grade | --

Duration | Module level | Other prerequisites
---|---|---
1 semester | graduate | --

Contents
The primary object of this course is to gain a detailed understanding of strategic networks and of the phenomenon of clustering in the industrial industry. The example of the international automotive industry is used for clarification of the theoretical contents.
The focus is on marketing in industrial companies and also on CSR - CSR is considered the "driver" of sustainable innovations - as well as the different strategy types of sustainable innovations.
Outline of syllabus:
1. Strategic networks and clusters in industrial industries such as the automotive industry
2. Transaction types of Williamson as well as strategic cooperation between automobile manufacturers and suppliers
3. Management of business types, in particular the business of suppliers in the automotive industry
4. Cluster and entrepreneurship activities
5. Sustainable innovation strategies

Intended learning outcomes
By the end of the course, students gain a profound understanding above the basics of network research. Furthermore, students will acquire sectoral knowledge of the automotive industry as well as detailed cluster skills.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 minutes)
Language of assessment: German and/or English

Allocation of places
--

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title: Strategic Marketing
Abbreviation: 12-M-SM-161-m01

Module coordinator
Holder of the Chair of Business Management and Marketing
Module offered by
Faculty of Business Management and Economics

ECTS: 5
Method of grading: numerical grade
Only after succ. compl. of module(s): --

Duration: 1 semester
Module level: graduate
Other prerequisites: --

Contents

Description:
The module raises awareness in students of the relevance and necessity of strategic management in a competitive and dynamical competitive process.

Content:
Based on the marketing strategies as well as the stakeholder and entrepreneurship approaches, this module discusses the roots of the concept of strategy in marketing based on Drucker, Porter, Ansoff and Mintzberg. The focus of the module is on thinking in competitive advantages, which is directly related to responsible leadership.

Outline of syllabus:
1. Competitive dynamics requires strategy and leadership
2. Marketing strategies, stakeholder management and entrepreneurship
3. Objectives and tasks of corporate governance in management practice
4. Competitive forces, strategies and benefits according to Michael Porter
5. Growth strategies and marketing myths
6. Future technologies, new businesses and dynamic capabilities
7. Nature and principles of responsible management

Reading:

### Intended learning outcomes

The students have a deeper understanding of the sustainable corporate management and have the basics of the competitive process and competitive dynamics available. In addition, they can use the acquired knowledge, while taking into account the conventional problems of the strategic and sustainable management, to solve business case studies on their own.

### Courses

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### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
## Module Catalogue for the Subject Information Systems

### Master's with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
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<td>Industrial Management 4</td>
<td>12-M-BE-192-m01</td>
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<td>Faculty of Business Management and Economics</td>
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<td>1 semester</td>
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### Contents

This course will develop the objectives, principles and structure of electronically supported procurement processes with a special focus on catalogue-based procurement systems, electronic tendering systems, electronic (reverse) auctions, e-marketplaces, supplier relationship management systems and eSupply chain management systems.

### Intended learning outcomes

The students will be able to describe and evaluate both the potentials and goals of electronic supported procurement systems and will be able to design appropriate systems for real-life applications. Students will get insight into the essentials of operational procurement management, especially e-procurement with a focus on catalog-based procurement systems, electronic tendering systems, electronic (reverse) auctions, e-marketplaces, supplier relationship management systems and eSupply chain management systems. After completing this module, students can define and analyze the related tasks and processes and show or develop theory-based and application-oriented possible solutions at a high professional level.

### Courses

**Type, number of weekly contact hours, language — if other than German**

V (2) + Ü (2)

### Method of assessment

**Type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus**

a) Written examination (approx. 40 to 60 minutes) or  
b) Presentation (approx. 20 Minutes) and term paper (15 to 20 pages), weighted 1:1 or  
c) Term paper (30 to 40 pages) or  
d) entirely or partly computerised written examination (approx. 60 minutes) or  
e) Portfolio (approx. 20 pages)  

Creditable for bonus  
Language of assessment: German and/or English

### Allocation of places

20 places.  
(1) A total of 15 places will be allocated to students of the Master's degree programmes Management as well as International Economic Policy. Should the number of applications exceed 15, these places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.  
(2) A total of 5 places will be allocated to students of the Master’s degree programme Information Systems. Should the number of applications exceed 5, these places will be allocated by lot. A waiting list will be maintained and places re-allocated by lot as they become available.  
(3) When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

### Additional information

Module can be taught in form of E Learning course, seminar, workshop etc.

**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
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**Contents**

This module analyses and classifies approaches of production planning and control. In addition, it develops methods and models of lot sizing and scheduling. The focus is on the determination of optimal production and transport volumes as well as the planning of orders and manufacturing orders.

**Intended learning outcomes**

Students learn essential concepts, principles and methods of production planning and control with emphasis on the determination of optimal production and transport volumes as well as the planning of production and order sequences. Then, based on this expertise related knowledge broadening and deepening, essential competencies are conveyed, which allow the imaging of realistic situations and problems using mathematical and quantitative models for the derivation and assessment of alternative courses of action. After completion of the module students can answer, analyze and structure questions of production planning and control, goal-oriented. They can also arrange the planning areas in the overall business context and have an in-depth overview of the production planning and control.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Course type: might also be offered as eLearning, seminary, workshop, etc.

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 40 to 60 minutes) or b) presentation (approx. 20 minutes) and term paper (15 to 20 pages), weighted 1:1 or c) term paper (approx. 30 to 40 pages) or d) entirely or partly computerised written examination (approx. 60 minutes) or e) portfolio (approx 20 pages)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title: Industrial Management 1
Abbreviation: 12-M-SBM-182-m01

Module coordinator: Holder of the Chair of Business Management and Industrial Management
Module offered by: Faculty of Business Management and Economics

ECTS: 5
Method of grading: numerical grade
Only after succ. compl. of module(s): --
Duration: 1 semester
Module level: graduate
Other prerequisites: --

Contents:
The course addresses central issues of strategic supply management. The supply function of the company (purchasing, materials management, procurement logistics) and its strategic importance are analysed and basic methods are developed that are relevant in this area.

Intended learning outcomes:
Students learn the principles of performance-oriented optimization of all procurement activities to develop long-term, competitively sensitive potential for success. After completion of the module students are able to prepare structured, goal-oriented analyze and to respond to performance-oriented issues of strategic procurement based on key instruments. Students are able to accurately classify the tasks of the procurement and to describe and discuss their strategic importance and dominate essential methods and procedures used in this area to apply.

Courses:
V (2) + Ü (2)
Course type: might also be offered as eLearning, seminary, workshop, etc.

Method of assessment:
- a) written examination (approx. 40 to 60 minutes)
- b) presentation (approx. 20 minutes)
- c) term paper (15 to 20 pages), weighted 1:1
- d) entirely or partly computerised written examination (approx. 60 minutes)
- e) portfolio (approx 20 pages)

Language of assessment: German and/or English
creditable for bonus

Allocation of places:
20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)
--
### Module title

**Industrial Management 3**

### Abbreviation

12-M-SPM-182-m01

### Module coordinator

Holder of the Chair of Business Management and Industrial Management

### Module offered by

Faculty of Business Management and Economics

### ECTS

5

### Method of grading

[numerical grade] --

### Only after succ. compl. of module(s)

--

### Duration

1 semester

### Module level

graduate

### Other prerequisites

--

## Contents

This module will discuss contents and procedures of strategic production management and, in particular, planning and control concepts.

Students will become familiar with the essentials of strategic production management. Theoretical and analytical models will be used for analysing both economic and ecological issues. In addition, the module will discuss principles of value structure optimisation and will develop competences regarding the development of integrated mathematical models.

## Intended learning outcomes

After completion of the module students are able to process, to analyze and answer questions of operations strategy structured and goal-oriented in a global context using appropriate methods. Furthermore, they know the main strategic tasks and objectives in production management and evaluate and apply planning and control concepts for the production in realistic application situations.

## Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

Course type: might also be offered as eLearning, seminary, workshop, etc.

## Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 40 to 60 minutes) or b) presentation (approx. 20 minutes) and term paper (15 to 20 pages), weighted 1:1 or c) term paper (approx. 30 to 40 pages) or d) entirely or partly computerised written examination (approx. 60 minutes) or e) portfolio (approx 20 pages)

Language of assessment: German and/or English

creditable for bonus

## Allocation of places

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

## Additional information

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## Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module title: Legal Foundations of Risk Management and Compliance
Abbreviation: 12-M-RM1-161-m01

Module coordinator: Holder of the Chair of Financial Accounting
Module offered by: Faculty of Business Management and Economics

ECTS: 2
Method of grading: Only after success. completion of module(s)

Duration: 1 semester
Module level: Graduate
Other prerequisites: --

Contents:
Content: This module analyses the presentation of opportunities and risks in financial reports, i.e. annual or interim reports, in conjunction with selected value-based management and profitability analysis approaches.

Outline of syllabus:
1. Basics of financial reporting and risk management;
2. Practice of risk reporting;
3. Profitability analysis according to Penman;
4. Value-based management and risk management;
5. Residual income and business valuation;
6. Analysis of equity risk;
7. Analysis of credit risk;
8. Risk management monitoring by audit committees and auditors.

Reading list to be provided in class.

Intended learning outcomes:
After completing the course, the students will be able
1. to present the relation between risk management and financial reporting;
2. to analyze and solve independently complex problems with respect to the presentation of opportunities and risk in financial reports based on national and international standards;
3. to identify the relation between risks and value-based management;
4. to evaluate independently selected research results concerning risk reporting and designing own research- or practice-oriented projects.

Courses (type, number of weekly contact hours, language — if other than German)
V (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)
Language of assessment: German and/or English
creditable for bonus

Allocation of places:
30 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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### Module title

**Financial Statement Analysis and Business Valuation**

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<th>Module coordinator</th>
<th>Faculty of Business Management and Economics</th>
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<td>5</td>
<td>Holder of the Chair of Financial Accounting</td>
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**Method of grading**

Only after succ. compl. of module(s)

**Numerical grade**

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**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

### Contents

Fundamental investing involves valuation, and much of the information for valuation is contained in financial statements. This module provides a basic understanding of financial statement analysis, particularly on how to extract value-relevant information from financial statements, carry out financial statement analysis, and use financial data to value corporations. The module also provides the necessary tools to gain insights into what generates value in a corporation.

### Intended learning outcomes

Students can understand publicly traded companies’ financial statements (US GAAP/IFRS), identify value-relevant information in financial statements, and use this information for valuation. They know the relevant techniques to evaluate financial statements and understand the fundamental role of financial information in the valuation process. Students can apply valuation techniques to real-world cases and recommend investment decisions.

### Courses

(type, number of weekly contact hours, language — if other than German)

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### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- **written examination** (approx. 60 to 120 minutes)
- Language of assessment: German and/or English
- creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
Module Catalogue for the Subject
Information Systems
Master’s with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<td>Philosophy of Science and Ethics in Business Management and Economics</td>
<td>12-M-WEW-182-m01</td>
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<td>Holder of the Chair of Financial Accounting</td>
<td>Faculty of Business Management and Economics</td>
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<td>1 semester</td>
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</table>

**Contents**

This module will take the form of a seminar. Participants will independently work on a problem in economic policy or will review an important publication on a topic in economics.

**Intended learning outcomes**

Students are able to present the status of a current project in a talk as well as to discuss and defend it.

**Courses** (type, number of weekly contact hours, language — if other than German)

| S (2) |

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Term paper (approx. 20 to 25 pages) and presentation (approx. 20 minutes), weighted 2:1

Assessment offered: In the semester in which the course is offered

Language of assessment: German and/or English

Creditable for bonus

**Allocation of places**

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places reallocated by lot as they become available.

**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
## Module Catalogue for the Subject

### Information Systems

#### Master's with 1 major, 120 ECTS credits

<table>
<thead>
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<tr>
<td>Risk Management - Concepts and Systems</td>
<td>12-RM-KS-161-m01</td>
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<td>holder of the Chair of Business Management and Accounting</td>
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### Contents

**Concepts:** The course will provide students with an overview of the main goals, contents, methods and instruments of opportunity and risk management in industrial and commercial enterprises. **Systems:** The course will provide students with an overview of the design and functionality of essential information systems for risk management.

### Intended learning outcomes

**Concepts:** After completion of the module students have a sound understanding of basic concepts, processes, methods and tools of risk management. They are able to justify the duties and functions of risk management in the company in theory and practice. They can also evaluate proposed solutions for the design of a risk management system, analyze selected issues of risk management and building on that, develop their own solutions. **Systems:** After completing this module, students can

(i) judge legal, organizational and methodological requirements for the implementation of risk management processes in a risk management information system (RMIS);
(ii) understand the technical basis for RMIS;
(iii) estimate the different characteristics of various information systems for the RM;
(iv) understand the workings of RMIS.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) oral examination (one candidate each: approx. 15 to 20 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes)

Language of assessment: German and/or English creditable for bonus

### Allocation of places

25 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module title         Abbreviation
Discounted Cashflow  12-M-CF1-182-m01

Module coordinator    Module offered by
Holder of the Chair of Corporate Finance  Faculty of Business Management and Economics

<table>
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<tr>
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Duration      Module level  Other prerequisites
1 semester  graduate  --

Contents
The module covers discounted cash flow (DCF) methods under certainty as well as uncertainty in the context of the valuation of unlevered and levered companies. Furthermore, tax aspects as well as their influence on the company value are considered.

Syllabus:
1. Introduction
2. DCF Theory under certainty
   1. NPV without taxes
   2. NPV with personal taxes
   3. NPV with corporate taxes
3. DCF Theory under uncertainty
   1. DCF basics
   2. Valuation of unlevered companies
   3. Valuation of levered companies
4. Practice of DCF methods

Intended learning outcomes
After completion of this module, the students will know a variety of discounted cashflow techniques and are able to apply properly them in order to evaluate projects or firms.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 90 minutes) or b) term paper (approx. 15 pages)
Language of assessment: German and/or English
creditable for bonus

Allocation of places
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Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
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<td>Portfolio and Capital Market Theory</td>
<td>12-M-CF2-182-m01</td>
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<tbody>
<tr>
<td>Holder of the Chair of Corporate Finance</td>
<td>Faculty of Business Management and Economics</td>
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### Contents

This module conveys profound knowledge of individual portfolio choices and on this basis the most important capital market theory (namely capital asset pricing model) is introduced, including its assumptions, implications and extensions.

**Syllabus:**

1. Modern Portfolio Selection
   1. 2 Asset-Case
   2. Multiple-Asset-Case
   3. Critique of Portfolio Theory
2. Capital Asset Pricing Model
   1. Assumptions and Derivation
   2. Implications
   3. Empirical Aspects, Extensions and Alternatives

### Intended learning outcomes

This module enables the students

(i) to explain and to determine the optimal capital market position of an investor given the different investment opportunities and individual utility function;

(ii) to understand and use the central CAPM propositions for valuating risky assets.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 90 minutes) or b) term paper (approx. 15 pages)

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<td>Risk Management and Corporate Finance</td>
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**Contents**

This module deals with the valuation and use of classical derivatives in financial markets. In particular, futures, swaps and options are considered as well as their possible applications in the context of financial risk management. In particular, students will be introduced to the theory involved in pricing options, as well as important valuation parameters. In addition, some established risk measures such as value-at-risk are discussed.

1. Introduction
2. Futures & Forwards
3. Swaps
4. Options
5. Measures of risk

**Intended learning outcomes**

Upon completion of this module students will be able to,

(i) independently determine the fair value of the derivatives discussed, as well as

(ii) to understand and evaluate common capital market hedging strategies.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 90 minutes) or b) term paper (approx. 15 pages)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module title
Risk measurement and risk valuation: Concepts and applications for banks

### Abbreviation
12-M-CF5-182-m01

### Module coordinator
Holder of the Chair of Corporate Finance

### Module offered by
Faculty of Business Management and Economics

### ECTS
5

### Method of grading
Numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
Graduate

### Other prerequisites
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### Contents
The course augments the usual consideration of symmetric risk metrics by introducing metrics for downside risks and the concept of risk as a capital requirement. The focus for applications in banks lies in the treatment of risks with regard of supervisory regulations.

### Intended learning outcomes
After completing the course “Risk measurement and risk valuation: Concepts and applications for banks” the students are able
1. to judge the appropriateness and problems of asymmetric risk measures,
2. to address essential risks in banks and to understand their handling by supervisory regulations as well as
3. to realize the concept of risk as a capital requirement being the systematic base for these aspects in the banking sector.

### Courses
(V (2) + Ü (2))

### Method of assessment
A) written examination (approx. 60 minutes) or B) term paper (approx. 15 pages)

Language of assessment: German and/or English

Credits for bonus: --

### Allocation of places
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### Additional information
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**Contents**

This course deals with tax effects on fundamental economic decisions. Taxes are integrated into standard models for investment decisions, financing decisions, firm valuation, dividend policy and remuneration of employees. Therefore, the interaction of corporate and personal income taxes is analysed. A reading list in English is available on request.

**Intended learning outcomes**

This course enables students to
(i) combine their knowledge of tax law with microeconomic analyses in the areas of corporate and personal finance;
(ii) analyze the effect of taxes on fundamental economic decisions, e.g. investment and financing decisions, evaluation of investment, financial assets, forms of remuneration for employees including managing and assessing;
(iii) read and discuss research and policy papers in the field of taxation.

**Courses**

(2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages) or c) oral examination of one candidate each (approx. 20 minutes)

Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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## Module Catalogue for the Subject Information Systems

### Master's with 1 major, 120 ECTS credits

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### Contents

This module introduces the various methods of income recognition in the German Income Tax Code (*Einkommensteuergesetz*, EStG). It discusses the main reporting and valuation provisions as well as the specific problems and techniques of income calculation for partnerships.

### Intended learning outcomes

Students have in-depth knowledge of tax accounting of companies and are able to solve moderate to complex problems of tax accounting in particular of sole proprietorships and partnerships using legal source.

### Courses

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Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
### Module title
Incentives in Organizations

### Abbreviation
12-M-AO-182-m01

### Module coordinator
Holder of the Chair of Human Resource Management and Organisation

### Module offered by
Faculty of Business Management and Economics

### ECTS
5

### Method of grading
Numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

### Contents
Based on the classical principal-agent theory, this course discusses methodological and empirical aspects of incentives in organizations. It uses contents from advanced text books and original (mainly empirical) research articles.

#### Outline of syllabus
1. Principal-agent theory
2. Do top managers earn too much? (application)
3. Performance-based payment
4. Implementation of performance-based payment in companies (application)
5. Seniority payment (with application)
6. Financial incentives to work after retirement (with application)
7. Efficiency wages (with case study)
8. Team incentives (with case study)

### Intended learning outcomes
Students acquire a working knowledge of key incentive models, selected empirical applications and the necessary econometric background. This enables them to identify the advantages and disadvantages of different incentive systems that are applied in the enterprise context, to make informed management analyses and to critically evaluate current controversies and developments as well as to conduct their own research.

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### Module taught in: English

### Method of assessment
(a) written examination (approx. 60 minutes) or (b) term paper (approx. 15 pages)

Language of assessment: German and/or English

### Allocation of places
--

### Additional information
--

### Referred to in LPO I
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Human Resource Management and Industrial Relations | 12-M-HRM-192-m01

Module coordinator | Module offered by
---|---
Holder of the Chair of Human Resource Management and Organisation | Faculty of Business Management and Economics

ECTS | Method of grading | Only after succ. compl. of module(s)
---|---|---
5 | numerical grade | --

Duration | Module level | Other prerequisites
---|---|---
1 semester | graduate | --

Contents
The lecture "Human Resource Management and Industrial Relations" introduces advanced theories, estimation techniques and empirical results from the areas of human resources management and institutional frameworks such as the different actors in industrial relations.

Syllabus
Introduction: Human Resource Management & Industrial Relationships
Chapter 1: The employment contract [formal model]
Chapter 2: Motivation [formal model]
Chapter 3: Employee resistance against reorganisations [empirical study]
Chapter 4: The role of works councils [formal model]
Chapter 5: Works councils and the employer wage structure [empirical study]
Chapter 6: The behaviour of labour unions [formal model]
Chapter 7: Learning process of employers [formal model and empirical study]
Chapter 8: Demographic challenges of HRM [formal model and empirical study]

Intended learning outcomes
The aim of the lectures is to enable students to understand and apply advanced theories, estimation techniques and empirical results in the area human resource management and industrial relations on the basis of scientific literature.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) Written examination (approx. 60 minutes) or
b) Term paper (approx. 15 pages)
Language of assessment: German and/or English

Allocation of places
There are no restrictions with regard to available places for students of the Master's degree programmes Management, International Economic Policy, Information Systems, Wirtschaftsmathematik (Mathematics for Economics) and Chinese and Economics as well as China Business and Economics. A total of 20 places will be allocated to students of other subjects; should the number of applications exceed the number of available places, these places will be allocated by lot.
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</table>
Module title

Advanced Seminar: Entrepreneurship and Management

Abbreviation

12-M-SAS-182-m01

Module coordinator

Holder of the Chair of Entrepreneurship and Strategy

Module offered by

Faculty of Business Management and Economics

ECTS

10

Method of grading

Numerical grade

Only after succ. compl. of module(s)

Duration

1 semester

Module level

Graduate

Other prerequisites

--

Contents

Students develop seminar papers on varying topics in the domain of entrepreneurship, strategy, and innovation and present the key insights from their work.

Intended learning outcomes

**Educational aims**

- Enable students to position their research
- Enable students to critically review a substantial body of literature in short time
- Enable students to develop a sound theoretical framework
- Enable students to create a research paper fully meeting academic standards

**Learning outcomes**

On successful completion of this module students will be able to:

- Differentiate their research from previous work
- Adopt theoretical perspectives to understand complex phenomena
- Engage in comprehensive academic reasoning
- Articulate abstract and complex phenomena and relationships in written and oral form

Courses

**S (2)**

Method of assessment

Term paper (approx. 20 pages) and presentation (15 to 30 minutes), weighted 2:1

Assessment offered: Once a year, winter semester

Language of assessment: German and/or English

Allocation of places

20 places. (1) Should the number of applications exceed the number of available places, places will be allocated by lot among all applicants irrespective of their subjects. (2) Places on all courses of the module with a restricted number of places will be allocated in the same procedure. (3) A waiting list will be maintained and places re-allocated by lot as they become available.

Additional information

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Referred to in LPO I

(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Corporate Strategy | 12-M-UGf2-182-m01

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**Contents**

This theory-led and application-oriented module provides you with critical knowledge and skills related to corporate strategy—essential for anyone aspiring to take on leadership roles in their future career, may it be in the private or public sector. The module goes beyond basic knowledge about strategic management provided by bachelor-level modules.

1. Developing strategies in pursuit of competitive advantage
2. Corporate diversification
3. Vertical integration and outsourcing
4. Mergers & acquisitions
5. Dynamic strategies
6. Cooperative strategies
7. Corporate spin-offs and spin-outs
8. Internationalization strategies (I)
9. Internationalization strategies (II)
10. Strategic change
11. Corporate strategies and new technologies
12. Corporate governance and corporate social responsibility
13. Corporate communication and crisis management
14. Wrap-up and Q&A

**Intended learning outcomes**

**Educational aims**

- Clarify the role of corporate strategy
- Explain theoretical concepts and mechanisms behind corporate strategy
- Enable students to critically appraise alternative approaches to corporate strategy
- Enable students to evaluate the boundaries and risks of corporate strategy

**Learning outcomes**

On successful completion of this module students will be able to:

- Assess the role of corporate strategy for creating and sustaining competitive advantage
- Create and evaluate concepts related to corporate strategy
- Make judgements about the organizational and managerial implications of corporate strategy
- Systematically choose between different routes of action

**Courses** (type, number of weekly contact hours, language — if other than German)

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**Method of assessment** (type, scope, language — if other than German, examination offered — If not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 120 minutes) or b) term paper (15 to 20 pages) or c) oral examination of one candidate each (approx. 10 to 15 minutes) or oral examination in groups (groups of 2 approx. 20 minutes, groups of 3 approx. 30 minutes)

Language of assessment: English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
Change Management | 12-M-CHA-182-m01

Module coordinator
Holder of the Chair of Business Management, Management Accounting and Control

Module offered by
Faculty of Business Management and Economics

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Duration | Module level | Other prerequisites |
1 semester | graduate | -- |

Contents
Within the module, theoretical basics of change management are covered. In addition, we present and jointly analyze existing change projects in detail. We try to answer related questions, too. For example, the module discusses how to involve stakeholders in change, what motivates them to embrace change, and whether participation is a universal principle. The module covers projects like merging two departments, restarting a department with team building, conducting an employee survey, or developing a new mission statement. The majority of the projects are taken from the social sector, but can be transferred to industry and SMEs.

Intended learning outcomes
After participating the lecture, students will be able to understand the occurrence of resistance and massive emotional reactions in change processes. Change processes can be critically analyzed and the use of typical instruments in change processes can be questioned. Students are able to identify the typical pitfalls and hurdles in these processes and are able to use their knowledge for own future projects as well as to create their own solutions in change processes.

Courses (type, number of weekly contact hours, language — if other than German)
V (2) + Ü (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)
Assessment offered: In the semester in which the course is offered
Language of assessment: German and/or English creditable for bonus

Allocation of places
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Additional information
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### Contents

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### Intended learning outcomes

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### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)

Assessment offered: In the semester in which the course is offered

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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**Contents**

The module focuses on accounting instruments, which are applied in the context of strategic management of enterprises. First, it addresses important drivers of strategic decisions from a microeconomic perspective, such as the emergence of cost and quality advantages in competition as well as scale and experience curve effects. Second, the module covers analytical and heuristic techniques of planning and control. In the context of these techniques, instruments of target costing, life cycle cost analysis, benchmarking and business wargaming are discussed with regard to their theoretical foundation and fields of application.

**Intended learning outcomes**

Initially, knowledge about fundamental requirements concerning instruments of decision-making and behavior control within enterprises is acquired. What is more, the module conveys obtaining knowledge about the strengths and weaknesses and therewith fields of application and limits of prevalent instruments of strategic corporate management used by practitioners.

**Courses**

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<td>a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages) Language of assessment: German and/or English creditable for bonus</td>
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**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Coordination, Budgeting and Incentives in Organizations</td>
<td>12-M-KOBO-182-m01</td>
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<table>
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<tr>
<td>Holder of the Chair of Business Management, Management Accounting and Control</td>
<td>Faculty of Business Management and Economics</td>
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**Contents**

This module focuses on accounting-based instruments to control behavior in decentralized enterprises. The course first discusses the role of accounting in the context of decision-making and behavioral controlling as well as informational analyses. Afterwards, the most common instruments of behavioral controlling (budgeting, value-oriented management, transfer prices) are discussed with regard to theory and practice.

**Intended learning outcomes**

This module aims to provide knowledge in the context of behavioral control in enterprises. Knowledge about requirements on instruments used for behavioral control are discussed and competences for deployment, structure and development of coordination tools are provided.

**Courses**

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)

Language of assessment: German and/or English

creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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### Module Catalogue for the Subject

- **Information Systems**
- **Master's with 1 major, 120 ECTS credits**

<table>
<thead>
<tr>
<th>Module title</th>
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<tr>
<td>Project Management and Control</td>
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### Contents

The module focuses on the discussion and critical examination of instruments and methods used in the context of project management and control within enterprises. Both classic and agile approaches to project management are considered. It covers characteristic features and structures of projects, their possible success factors, methods and instruments of control and management of projects in various project phases. The theoretical basis as well as potential applications of these instruments are discussed.

### Intended learning outcomes

Initially, knowledge about fundamental requirements concerning instruments of project management and control is acquired. What is more, the module conveys knowledge about strengths and weaknesses and therewith fields of application and limits of commonly used instruments and methods of practitioners. Competences within the configuration and development of the project management and control as well as skills within the practical use are obtained.

### Courses

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### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Module title
**Accounting and Capital Markets**

**Abbreviation**
12-M-REKA-182-m01

### Module coordinator
**Holder of the Chair of Business Management, Management Accounting and Control**

### Module offered by
Faculty of Business Management and Economics

### ECTS
5

### Method of grading
Numerical grade

### Only after succ. compl. of module(s)
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### Duration
1 semester

### Module level
Graduate

### Other prerequisites
--

### Contents
The module focuses on financial and management accounting, their functions, possible configurations as well as their impact on internal and external recipients under consideration of the institutional setting. In this context, an economic perspective has priority over detailed legal arrangements and regulations by the standard setters. Based on the theoretical foundations of information economics as well as decision-making and balance sheet theories, typical issues concerning cost and managerial accounting as well as financial accounting and publicity are discussed.

### Intended learning outcomes
Initially, a fundamental knowledge about the conception and impact of management and financial accounting as information systems is acquired. In the following, the module mainly sharpens the understanding of the economic impacts of the configuration of management and financial accounting. What is more, extensive knowledge about possible impacts of changes in institutional general frameworks is covered. For example, changes in valuation standards, publicity rules or regulations about the distribution of profits in enterprises and on capital markets are considered.

### Courses
(type, number of weekly contact hours, language — if other than German)

**V (2) + Ü (2)**

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

- a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)
- Language of assessment: German and/or English
- creditable for bonus

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)

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### Module title
Managerial Analytics & Decision Making

### Abbreviation
12-M-MADM-182-m01

<table>
<thead>
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<tr>
<td>Holder of the Chair of Logistics and Quantitative Methods in Business Administration</td>
<td>Faculty of Business Management and Economics</td>
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#### ECTS
5

#### Method of grading
Numerical grade

#### Only after succ. compl. of module(s)
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#### Duration
1 semester

#### Module level
Graduate

#### Other prerequisites
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### Contents
The course "Managerial Analytics & Decision Making" discusses quantitative methods to structure and solve a diverse set of management problems and demonstrates the application of modern methods with the help of multiple case studies.

### Intended learning outcomes
After completing this course students can
(i) better understand and structure problems;
(ii) apply important theoretical and empirical frameworks to practical problems that evaluate good and bad decision making;
(iii) implement advanced analytical methods to support decision making under risk.

### Courses
(V (2) + Ü (2))
Module taught in: English

### Method of assessment
(a) written examination (approx. 60 minutes) or (b) term paper (approx. 15 to 20 pages)
Language of assessment: English
Creditable for bonus

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
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<td>Strategic Management of Global Supply Chains</td>
<td>12-M-SMGS-182-m01</td>
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</table>

**Contents**

Description:
In the course "Strategic Management of Global Supply Chains", students will become familiar with the basic principles of building an efficient global supply chain and will apply what they have learned working on multiple case studies.

**Intended learning outcomes**

After completing this course students
(i) can apply the basic methods and concepts of supply chain management to practical settings and evaluate the results, and
(ii) understand the effects of global value chains onto strategic company decisions.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

written examination (approx 60 minutes)
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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<td>Strategic Decisions and Competition</td>
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**Module coordinator**

Holder of the Chair of Industrial Economics

**Module offered by**

Faculty of Business Management and Economics

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</table>

**Contents**

1. Strategic situations and decision making
2. Analyzing strategic situations with game theory
   1. Noncooperative simultaneous move games
   2. Nash equilibrium
   3. Models of oligopoly markets
3. Dynamic Games
   1. Two(-multi) stage games and subgame perfect equilibrium
   2. Role of commitment in dynamic situations
   3. Models of advertising
   4. Wage bargaining and unions
4. Repeated Games
   1. Emergence of coordination in long interactions
   2. Collusion between competing firms
   3. Time consistent monetary policy
5. Static games of incomplete Information
   1. Bayesian Nash equilibrium
   2. Auctions
6. Dynamic games of incomplete information
   1. Moral hazard and nonlinear pricing
   2. Perfect Bayesian equilibrium
   3. Signalling games
   4. Job-market signalling
   5. Corporate investment and capital structure

**Intended learning outcomes**

After successful completion of this class, the students should be familiar with economic models that can be used to shape managerial strategy and aid in making decisions in strategic situations. Especially, by making use of simple two stage games, they should be able to formulate dynamic policies in a wide variety of strategic situations. The students will acquire an intuitive understanding of the underlying economic mechanisms which emerge from the analysis of game theoretic models for a wide variety of strategic situations arising in industrial economics, marketing, organization, finance, trade and labor. Moreover, they will acquire skills which enable them to make predictions in strategic situations by making use of simple mathematical models. By means of completing case based exercises, they will learn to transform real life business situations to an appropriate economic model. Based on an analysis of this model, they will be able to devise optimal strategies and derive the corresponding managerial implications.
The course will be taught in English.

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 120 minutes) or b) term paper (15 to 20 pages)
Language of assessment: English
creditable for bonus

**Allocation of places**
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**Additional information**
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**Referred to in LPO I** (examination regulations for teaching-degree programmes)
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Module title | Theory of Industrial Organization
---|---
Abbreviation | 12-M-TI1-182-m01

Module coordinator | Holder of the Chair of Industrial Economics
Module offered by | Faculty of Business Management and Economics

| ECTS | Method of grading | Only after succ. compl. of module(s) |
---|---|---|
5 | numerical grade | -- |

Duration | Module level | Other prerequisites |
---|---|---|
1 semester | graduate | -- |

Contents

Theory of industrial organisation:
1. Monopoly pricing
   - Nonlinear pricing and mechanism design
   - Dynamic pricing: experience goods, durable goods
2. Oligopoly pricing
   - Static price and quantity competition in homogeneous and differentiated goods markets
   - Comparative statics
   - Equilibrium market structure
3. Dynamic competition in oligopoly markets
   - Subgame perfect equilibrium and models of dynamic competition
   - Repeated games and collusion
4. Strategic behaviour by incumbent firms
   - Entry deterrence and predation
   - Signalling and reputation
5. Behavioral Industrial Organization
   - Reference Dependent Preferences and Framing Effects
   - Time inconsistent behavior

The course will be taught in English.

Intended learning outcomes

Students which complete this class will acquire a working knowledge of advanced theoretical models of competition in oligopoly markets as well as sophisticated pricing techniques in monopoly markets. They will learn the conditions under which the predictions of these models are valid. They will become familiar with applications of advanced game theoretic tools, such as dynamic models of competition, for studying interactions between firms in markets. By means of comprehensive exercises, they will apply the methods they learn in class to practically relevant problems. They will be in a position to read academic papers on related topics, assess the strengths and weaknesses of an approach, summarize and comment on these papers and suggest possible extensions.

Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 120 minutes) or b) term paper (15 to 20 pages)
Language of assessment: English
creditable for bonus

Allocation of places

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Additional information

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Referred to in LPO I (examination regulations for teaching-degree programmes)
### Module Catalogue for the Subject
Information Systems
Master's with 1 major, 120 ECTS credits

<table>
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<tr>
<th>Module title</th>
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<td>European Competition Policy</td>
<td>12-M-WPE-192-m01</td>
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</table>

### Contents
Outline of syllabus:
1. Legal environment, competition laws
2. Market definition
   - Qualitative methods
   - Simple quantitative methods
   - Hypothetical monopoly test
3. Horizontal agreements and collusion: repeated games and factors affecting likelihood of collusion
4. Horizontal mergers and collusion
   - Economic theory
   - Efficiency effects
   - Coordinated effects
5. Vertical relations and contracts
   - Economic analysis of contracts
   - "More economic approach"
6. Abuse of dominant position
   - Classification of abusive conduct
   - Economic analysis of abusive conduct and theory of harm

The course will be taught in English.

### Intended learning outcomes
After completion of the module students can use the advanced concepts introduced in the lecture of competition policy, including the legal framework, the trace models and methods for the study of competition policy issues, as well as understand the approach of European competition policy in high profile cases. When they are confronted with practical problems, they can refer to these cases, and the same logic to practical examples apply by draining the relevant economic theories that identify variables to be measured and methodologies for assessing, and based on that adequate conclusions for appropriate cases. They will sufficiently understand the subject in order to open up that build upon literature in journals and being able to think critically.

### Courses
(type, number of weekly contact hours, language — if other than German)

V (2)
Module taught in: English

### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) Written examination (approx. 60 to 120 minutes) or
b) Term paper (15 to 20 pages)
Creditable for bonus
Language of assessment: English

### Allocation of places
There are no restrictions with regard to available places for students of the Master's degree programmes Management, International Economic Policy, Information Systems, Wirtschaftsmathematik (Mathematics for Economics) and Chinese and Economics as well as China Business and Economics. A total of 20 places will be alloca-
ted to students of other subjects; should the number of applications exceed the number of available places, these places will be allocated by lot.

**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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**Module title**  
Econometrics 1

**Abbreviation**  
12-M-OE1-182-m01

**Module coordinator**  
Holder of the Chair of Econometrics

**Module offered by**  
Faculty of Business Management and Economics

**ECTS**  
5

**Method of grading**  
numerical grade

**Duration**  
1 semester

**Module level**  
graduate

**Other prerequisites**  
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### Contents

**Description:**  
This module deals with the basic concept and methodology of the ordinary least squares (OLS) regression model. In particular, model assumptions and properties are discussed and formally motivated. In addition, the module examines linear restrictions on the model's explanatory variables as well as dummy variables and introduces tests to verify simple and multiple linear restrictions.

Linear algebra is used as formal aid.

**Outline of syllabus:**
1. Random variables  
2. Important distributions  
3. Point estimates  
4. Simple linear regression model  
5. Model assumptions  
6. Model properties  
7. Simple hypothesis tests  
8. Multiple linear regression model  
9. Linear restrictions  
10. Dummy variables  
11. Multiple hypothesis tests

**Intended learning outcomes**

The students acquire knowledge of the basics, concepts and methods used in the classical linear regression model and understand the role of econometrics in science and data analysis. In particular, they learn how to analytically derive, calculate and interpret the coefficients, standard errors and p-values of a classic regression output of the multiple regression model. Furthermore, they are able to formally state and motivate the assumptions and properties of OLS and know how to deal with transformed and dummy variables. Additionally, students will be able to test multiple linear restrictions on the parameters and will be able to apply these tests to real economic, business and social science questions.

The competences acquired in this course serve as a prerequisite for "Econometrics II", "Econometrics III", "Microeconometrics" und "Financial Econometrics".

### Courses

**Type, number of weekly contact hours, language — if other than German**

V (2) + Ü (2)

Module taught in: German (winter semester), English (summer semester)

### Method of assessment

**Type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus**

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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<td>Advanced Microeconomics</td>
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<td>Faculty of Business Management</td>
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<tr>
<td>Theory and Information Economics</td>
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**Contents**

In a nutshell, microeconomic theory considers the behavior of individual economic agents and builds from this foundation to a theory of aggregate economic outcomes, which then can be applied for conducting welfare analysis and giving policy advice. This lecture addresses the core building block of this thought complex: individual decision making and behavior. Specifically, students will come to understand in detail the standard models of riskless consumer choice, choice under risk and intertemporal choice and learn about the empirical challenges and limitations of these models.

Throughout the lecture, we will work with precise mathematical formalizations of the ideas that we want to think and talk about. In consequence, a solid understanding of the mathematical toolbox of standard microeconomics (e.g., differential calculus and constrained optimization; basic set theory; integration by parts) will be helpful as it will allow to focus on the underlying economic intuition. However, every required mathematical concept will be introduced and explained along the way, such that a strong interest in formal economic analysis is more important than an advanced mathematical background.

The exposition is primarily based on the standard graduate textbooks


**Intended learning outcomes**

After completing the course students will be able to

- explain essential findings of microeconomic theory,
- apply the involved methods to given stylized examples on their own,
- recognize in which real life situations and how the results can be applied.

**Courses**

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**Method of assessment**

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**Allocation of places**

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<tr>
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- courses offered by new Chairs that are yet to be included in the FSB (subject-specific provisions)

The holders of the respective Chairs will ensure that the courses are eligible for credit transfer.

### Intended learning outcomes

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 to 90 minutes) or b) written examination (questions concerning mathematical methodology; approx. 120 minutes) or c) term paper (approx. 15 to 20 pages) or presentation (approx. 30 to 45 minutes)

Assessment offered: In the semester in which the course is offered

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
**Module title**  
Selected Topics in Business Management and Economics 2

**Abbreviation**  
12-M-APW2-161-m01

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<thead>
<tr>
<th>Module coordinator</th>
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**Intended learning outcomes**

As a result of accrediting multiple kinds of modules, a description of acquired skills cannot be given.

**Courses** (type, number of weekly contact hours, language — if other than German)

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Assessment offered: In the semester in which the course is offered

Language of assessment: German and/or English

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
### Module Catalogue for the Subject

#### Information Systems

**Master's with 1 major, 120 ECTS credits**

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d) oral examination (one candidate each: approx. 10 to 15 minutes; groups of 2: approx. 20 minutes; groups of 3: approx. 30 minutes) or
e) entirely or partly computerised written examination (approx. 60 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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- e) entirely or partly computerised written examination (approx. 60 minutes)

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

--
## Module title
Digital Marketing I

### Abbreviation
12-M-DM1-182-m01

### Module coordinator
Holder of the Junior Professorship of Digital Marketing and E-Commerce

### Module offered by
Faculty of Business Management and Economics

### ECTS
5

### Method of grading
Only after succ. compl. of module(s)

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
Digitalization is rapidly changing our lives, including all types of business relationships. Therefore, new opportunities and approaches have emerged in all areas of the marketing mix: Managers can choose from a wide variety of new communication channels, such as social media networks, blogs, or messengers, and can engage in influencer marketing and search engine optimization. They increasingly rely on online customer co-creation or crowdsourcing and create a wide variety of new digital products and services, often related to completely new business models. Through price crawlers and price setting tools customers' price search behaviors have significantly changed, requiring new price setting techniques. Artificial intelligence enables managers to automate and optimize many of these marketing processes, thus offering new opportunities and challenges for companies. Overall, digital marketing offers a tremendous variety of concepts and approaches to seize respective opportunities and deal with related challenges, which will be largely highlighted and discussed in this course.

### Intended learning outcomes
This course provides a broad overview about these new approaches of digital marketing. It explains the underlying concepts of digital marketing and illustrates these approaches and concepts along numerous case studies. After attending this course, students will have a broad as well as in-depth understanding of digital marketing and its tools. Moreover, they will understand how to implement these tools successfully in business practice.

### Courses
V (2) + Ü (2)  
Module taught in: English

### Method of assessment
a) written examination (approx. 60 to 120 minutes) or b) term paper (15 to 20 pages)  
Language of assessment: English  
creditable for bonus

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)
# Module Catalogue for the Subject Information Systems

**Master's with 1 major, 120 ECTS credits**

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## Contents

Students are required to put themselves in the following business situation:

A large corporation has just recruited you and your team members as the new heads of the marketing department in one of the firm's divisions in order to manage its general and digital marketing activities. Specifically, it is your task to manage the corporation's digital product portfolio, segmentation and positioning as well as its marketing mix strategy over a period of 10 years.

## Structure of the class:

- Long-term business simulation game (details see below) that students will play in groups
- Lectures and discussion rounds on strategic approaches to succeed over a duration of 10 periods

## Intended learning outcomes

Studierende lernen in diesem Kurs, zentrale Konzepte des Online- und Offline-Marketings gezielt und bezogen auf die jeweilige Unternehmenssituation anzuwenden. Der Kurs bildet somit die Brücke zwischen Theorievermittlung und entsprechende Anwendung in der Unternehmenspraxis.

## Courses

V (2) + Ü (2)  
Module taught in: English

## Method of assessment

a) written examination (approx. 60 to 120 minutes) or b) term paper (15 to 20 pages)

Assessment offered: In the semester in which the course is offered  
Language of assessment: English  
creditable for bonus

## Allocation of places

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## Additional information

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## Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Module title
E-Commerce I

### Abbreviation
12-M-EC1-182-m01

### Module coordinator
Holder of the Junior Professorship of Digital Marketing and E-Commerce

### Module offered by
Faculty of Business Management and Economics

### ECTS
5

### Method of grading
numerical grade

### Only after succ. compl. of module(s)
--

### Duration
1 semester

### Module level
graduate

### Other prerequisites
--

### Contents
E-commerce is a highly relevant field for almost all types of companies. However, the ecommerce approaches and strategies applied by companies differ strongly depending on the respective firm context (e.g., in terms of industry, types of customers, types of products). In this seminar, students analyze the specific e-commerce strategy of a selected firm. In doing so, they evaluate the strategies' current and future potential and make suggestions for improvements and for addressing future trends. Furthermore, each lecture session will contain short presentations where the students (in groups) will either apply selected lecture topics to real-world business cases or present the core aspects of research articles dealing with e-commerce topics in general.

### Intended learning outcomes
This class enables students to gain insights into real-life e-commerce strategies and to train their abilities in assessing business strategies.

### Courses
(type, number of weekly contact hours, language — if other than German)

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### Method of assessment
(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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- Language of assessment: English
- creditable for bonus

### Allocation of places
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### Additional information
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### Referred to in LPO I
(examination regulations for teaching-degree programmes)

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Module title | Abbreviation
---|---
E-Commerce II | 12-M-EC2-182-m01

Module coordinator | Module offered by
Dean of the Faculty of Business Management and Economics | Faculty of Business Management and Economics

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Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

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- Assessment offered: In the semester in which the course is offered
- Language of assessment: English
- creditable for bonus

Allocation of places
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Additional information
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**Contents**

The course teaches advanced approaches to process analytics. Students will learn to model and measure processes and process execution based on past and present data.

**Intended learning outcomes**

After successfully completing the course, students should be able to
- Understand process modeling and process execution in an SOA
- OLAP analysis in a process warehouse
- Business Rules for BPM
- Complex Event Processing
- Event-driven BPM using CEP and Business Rules

**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)
Module taught in: English

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)
Assessment offered: In the semester in which the course is offered
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Module title: Topics in Data Science

Abbreviation: 12-M-TDS-182-m01

Module coordinator: Holder of the Chair of Business Analytics

Module offered by: Faculty of Business Management and Economics

ECTS: 5

Method of grading: numerical grade

Only after succ. compl. of module(s): --

Duration: 1 semester

Module level: graduate

Other prerequisites: --

Contents:
Data science is concerned with extracting knowledge and valuable insights from data assets. It is an emerging field that is currently in high demand in both academia and industry. This course provides a practical introduction to the full spectrum of data science techniques spanning data acquisition and processing, data visualization and presentation, creation and evaluation of machine learning models.

The course focuses on the practical aspects of data science, with emphasis on the implementation and use of the above techniques. Students will complete programming homework assignments that emphasize practical understanding of the methods described in the course.

Intended learning outcomes:
Topics covered include:
- Data acquisition and processing
- Graph and network models
- Text analysis
- Working with geospatial data
- Usage of machine learning models (supervised and unsupervised)

Courses:
V (2) + Ü (2)

Module taught in: English

Method of assessment:
a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages)
Assessment offered: In the semester in which the course is offered
Language of assessment: German and/or English

Allocation of places:
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Additional information:
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Referred to in LPO I (examination regulations for teaching-degree programmes):
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### Module title
**Topics in Information Systems 1**

### Abbreviation
12-M-TIF1-182-m01

### Module coordinator
Dean of the Faculty of Business Management and Economics

### Module offered by
Faculty of Business Management and Economics

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Language of assessment: German and/or English

### Allocation of places
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### Additional information
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### Module Catalogue for the Subject Information Systems

**Master's with 1 major, 120 ECTS credits**

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### Courses

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

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Assessment offered: In the semester in which the course is offered

Language of assessment: German and/or English creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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### Module Title

**Stochastic Models for Risk Analysis**

### Abbreviation

12-RM-RA-192-m01

### Module Coordinator

Dean of Studies Mathematik (Mathematics)

### Module Offered by

Faculty of Business Management and Economics

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### Duration

1 semester

### Module Level

Graduate

### Other Prerequisites

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## Contents

- Point and interval estimation for the value at risk
- Point and interval estimation for the conditional value at risk
- Prediction of value at risk in time series
- Risk of forecasts in time series, in particular exponential smoothing under covariates
- Conditional heteroscedasticity: ARCH, GARCH, EGARCH, DVEC, BEKK, DCC
- Aggregated losses and their empirical analysis
- Empirical analysis of statistical distributions
- Nonparametric bounds for the value at risk
- Empirical estimation of nonparametric bounds for value at risk
- Conditional value at risk
- Market model: definition, derivation, parameters, empirical analysis
- Capital asset pricing model: definition, parameters, empirical analysis
- Asset portfolios: definition, risk parameters
- Estimation of portfolio parameters: variance, value at risk, conditional value at risk, shortfall
- Optimum portfolios: concepts, theory, numerical analysis

## Intended Learning Outcomes

The student is able to estimate risk measures and the parameters of risk models from data. In particular, the student knows software packages and routines which enable empirical risk evaluation in a business context.

### Courses

- Ü (2) + V (2)

### Method of Assessment

- Written examination (approx. 60 minutes)

### Allocation of Places

30 places.

Should the number of applications exceed the number of available places, places will be allocated as follows:
1. Master's students of Information Systems will be given preferential consideration.
2. The remaining places will be allocated to students of other subjects.
3. When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

### Additional Information

--

### Referred to in LPO I

(examination regulations for teaching-degree programmes)

--
**Module title**

Stochastic Models for Risk Assessment

**Abbreviation**

12-RM-RW-192-m01

**Module coordinator**

Dean of Studies Mathematik (Mathematics)

**Module offered by**

Faculty of Business Management and Economics

**ECTS**

5

**Method of grading**

Only after succ. compl. of module(s)

**Numerical grade**

--

**Duration**

1 semester

**Module level**

graduate

**Other prerequisites**

--

**Contents**

- Etymological background of the risk concept
- Definitions of risk
- Basic concepts and terminology of stochastic risk modelling: risk phenomenon, risk object, risk variable, risk source, risk factor, risk cause, direct peril, indirect peril, loss under risk, profit under risk, loss variable, profit variable, risk distribution, risk indicator, risk parameter
- Classification of business risks
- Risk policy, risk management
- Risk analysis: risk identification, risk description, risk exploration, risk-relevant measurements, risk evaluation, risk assessment, risk modelling
- Risk management: risk minimisation, risk protection, risk avoidance, risk mitigation, bearing of risk, risk prevention
- Risk control, risk monitoring
- FMEA (Failure Mode and Effect Analysis) as a tool of risk analysis and risk assessment: historical and thematic background, methodology, discussion of the FMEA assessment methodology
- Risk matrix, risk diagram
- Score diagram
- Stochastic risk parameters and risk measures as distribution parameters
- Probability distributions: Gaussian, Laplace, Student’s t, extreme value, logistic, exponential, Weibull, gamma, negative Gaussian, Burr, hyperbolic, generalised hyperbolic
- Elementary stochastic risk measures: variance, standard deviation, signal-to-noise ratio, coefficient of variation, Sharpe ratio, nonconformance probability, expected shortfall, shortfall probability, risk parameters under reference values
- Stone family
- Value at Risk and Conditional Value at Risk: definition, formal representations, values under special probability distributions
- Axioms of risk measures: distribution invariance, subadditivity, superadditivity, additivity, comonotonous additivity, nonnegative homogeneity, translation invariance, convexity, continuity, coherence

**Intended learning outcomes**

- The student knows the schemes and concepts of risk analysis, risk assessment, risk measurement, and the theoretical background. The student knows the concepts of advanced stochastic risk modeling. In a practical business situation, the student is able to identify an appropriate scheme of risk assessment and corresponding meaningful risk measures.

**Courses**

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

Written examination (approx. 60 minutes)

**Allocation of places**

30 places.

Should the number of applications exceed the number of available places, places will be allocated as follows:

1. Master’s students of Information Systems will be given preferential consideration.
2. The remaining places will be allocated to students of other subjects.
3. When places are allocated in accordance with (1) and (2) and the number of applications exceeds the number of available places, places will be allocated by lot among applicants from this group.

**Additional information**

--

**Referred to in LPO I** (examination regulations for teaching-degree programmes)

--
Module title | Abbreviation
--- | ---
Communication in Business and Economics | 12-M-BUC-182-m01

Module coordinator | Module offered by
Holder of the Professorship of Economic Journalism | Faculty of Business Management and Economics

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<td>1 semester</td>
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Contents
The lecture names introductory relevant communication models. Furthermore, the theoretical models of PR are discussed. The added value of communication for companies, business, politics, and science is explained. The discrepancy between journalism and PR is discussed, as well as the basic elements, instruments, goals, and forms of PR. The preparation and implementation of press meetings, conferences, campaigns, and events will be systematically explained, and the central aspects of corporate communications will be outlined. The exercise deals with the practical implementation of journalistic styles in the various media and provides an overview of the possibilities and concepts of PR work across different media and target groups.

Intended learning outcomes
After participating in the module courses, students are able to understand and apply PR and its forms, elements as well as methods and in a holistic context. Students learn professional competencies in the field of (business) communication with regard to reflection, argumentation, and exchange as a PR consultant in different areas. In addition, students will be able to apply concrete PR instruments in practice and prepare them professionally.

Courses
(V (2) + Ü (2)
Module taught in: English

Method of assessment
written examination (approx. 60 minutes)
Language of assessment: English
creditable for bonus

Allocation of places
--

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
--
Module title: Business Communication in Print, Online and Social Media

Abbreviation: 12-M-ECC-182-m01

Module coordinator: Holder of the Professorship of Economic Journalism

Module offered by: Faculty of Business Management and Economics

ECTS: 5

Method of grading: numerical grade

Duration: 1 semester

Module level: graduate

Contents:
This module focuses on the relationship of offer characteristics with benefit aspects for the end consumer and the business models on the part of the providers. Starting from the basics of editorial work and professional text management, the new forms of communication management in social networks are presented. The focus of the lecture is on the use of social media in campaigns (Facebook, Twitter, Instagram, Tiktok). There will also be exercises on various Web 2.0 applications (e.g. online social networks) and on the collection and interpretation of online market research data. However, crisis communication of companies will also be covered in particular opinion-makers on the web as well as protest culture on the web.

Intended learning outcomes:
By participating in the module courses, students acquire job-specific skills in research and interviewing. Students are able to collect and organize information according to criteria of topicality and relevance. In addition, students are taught journalistic expertise so that they are able to recognize the forms of presentation of news, reports, and background reports with their media characteristics and communicative functions in different media genres and create them themselves. Students will be able to prototype and design a social media campaign, describe the editorial and technical approach including feedback, response, and customer engagement. In addition, students will be able to design counter-strategies for corporate communication crises.

Courses:
V (2) + Ü (2)

Method of assessment:
written examination (approx. 60 minutes)
Language of assessment: German and/or English
creditable for bonus

Allocations of places:
--

Additional information:
--

Referred to in LPO I:
(examination regulations for teaching-degree programmes)

--
Managerial Practice Lectures

Module coordinator: Holder of the Professorship of Economic Journalism
Module offered by: Faculty of Business Management and Economics

ECTS: 5
Method of grading: numerical grade
Duration: 1 semester
Module level: graduate
Other prerequisites: --

Contents
In this lecture, we invite board members of publicly listed companies, SMEs and Startups to discuss contemporary challenges of corporate management.

Students gain sustainable insights into current management practices, challenges of corporate management in various industries, and discuss pressing managerial issues with C-level executives. In individual and group assignments, students are required to connect management theories with the managerial challenges of the speakers.

Managers of the different companies are required to address the following questions that will foster a detailed discussion at the end of each lecture:

- What are the current challenges facing your company?
- Which strategies do you employ to respond to these challenges?
- How have leadership concepts and approaches changed in your company?

Intended learning outcomes
After participating in this module, students should be able to combine theoretical approaches with current challenges in management. The students obtain a realistic insight into a cross-section of the German economy. Through discussions reports and group presentations students’ social skills are trained in addition to professional skills.

Courses (type, number of weekly contact hours, language — if other than German)
S (2)

Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
portfolio (approx. 15 pages)
Language of assessment: German and/or English

Allocation of places
--

Additional information
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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<table>
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<th>Module title</th>
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<tbody>
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<td>Advanced Topics in Data Science</td>
<td>12-M-ATDS-211-m01</td>
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<th>Module offered by</th>
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<tbody>
<tr>
<td>Holder of the Chair of Business Analytics</td>
<td>Faculty of Business Management and Economics</td>
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### Contents

In this course, students work on advanced data science projects. The course covers the entire data science workflow from data collection to data preparation to modeling, evaluation and deployment. By following a top-down teaching approach, students are enabled to apply complex machine learning models from the beginning.

### Intended learning outcomes

As part of the course work, students will acquire knowledge and skills in the following areas:
1. Becoming familiar with the principles and frameworks in the research area of Data Science.
2. Apply machine learning and deep learning frameworks to structured and unstructured data
3. Design, implementation and evaluation of key algorithms within an end-to-end workflow in the field of Data Science
4. Application of Jupyter notebooks and their infrastructure (collection, storage, retrieval, and analysis of data)
5. Understanding of a data-driven & analytical approach to decision problems

### Courses

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<td>V (2) + Ü (2)</td>
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Module taught in: English

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or
b) term paper (approx. 15 pages)

Language of assessment: German and/or English

Assessment offered: Only when announced in the semester in which the courses are offered creditable for bonus

### Allocation of places

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### Additional information

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### Referred to in LPO I

(examination regulations for teaching-degree programmes)

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<table>
<thead>
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<td>International Marketing Strategy</td>
<td>12-M-IMS-211-m01</td>
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<tr>
<td>Dean of the Faculty of Business Management and Economics</td>
<td>Faculty of Business Management and Economics</td>
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## Contents

The objective of this simulation course is to develop hands-on skills of how to make international marketing decisions. Emphasis is put on the computer simulation game Country Manager which focuses on the managerial issues arising when companies plan and execute market entry into new countries. This exercise allows students to experience the challenges pertaining to corresponding decisions by playing the role of a responsible manager for a major consumer products company. Students have to decide on the countries to enter, the mode of entry, the segments to target, and every aspect of the marketing mix (price, promotion, place and product) and will get immediate feedback on the consequences of their actions.

### Intended learning outcomes

After completion of the course, participants should have gained a broad appreciation of critical decisions in international marketing.

### Courses (type, number of weekly contact hours, language — if other than German)

S (2)

### Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (40 to 60 minutes) or  
b) term paper (15 to 20 pages) and presentation (approx. 20 minutes) (weighted 2:1) or  
c) term paper (30 to 40 pages) or  
d) portfolio (approx. 20 pages)  
Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

--
## Module Catalogue for the Subject Information Systems

### Master’s with 1 major, 120 ECTS credits

<table>
<thead>
<tr>
<th>Module title</th>
<th>Abbreviation</th>
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<tbody>
<tr>
<td>Economist Practice Lectures</td>
<td>12-M-VWP-211-m01</td>
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<tr>
<td>Holder of the Senior Professorship for Economics, Money and International Economic Relations</td>
<td>Faculty of Business Management and Economics</td>
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### Contents

The content of the seminar is the active participation in as well as the follow-up of the lectures of economists from different national and international fields of activity, which are organized for the event.

The invitation of speakers from practice strengthens the practical orientation of the scientifically founded and at the same time internationally oriented education at the faculty of economics of the University of Würzburg.

In this way, students will gain lasting insights into the fields of activity of economists, gain an insight into practical activities, discuss these with high-ranking economists and combine them with theoretical economic knowledge gained during their studies.

### Intended learning outcomes

By participating in the seminar, Master's students of the faculty of economics and business administration should get to know the different fields of activity of economists and the questions that determine the daily work of the speakers in the course of the lectures.

In addition, the participants of the seminar will have the opportunity to apply the knowledge of economics they have acquired during their studies. For this purpose, in addition to a discussion with the speakers following the respective lecture, a debating workshop is offered to the participants of the seminar, in which the students are to learn economic argumentation and debate management. The learned contents and competencies will be tested at the end of the semester.

### Courses

(type, number of weekly contact hours, language — if other than German)

S (2)

### Method of assessment

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) oral examination (one candidate each: approx. 10 to 15 minutes, groups of 2: approx. 20 minutes, groups of 3: approx. 30 minutes) or
b) term paper (approx. 10 pages) and presentation (approx. 15 minutes); (weighted 2:1) or
c) written examination (approx. 60 minutes)

Language of assessment: German and/or English

### Allocation of places

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### Additional information

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### Referred to in LPO I (examination regulations for teaching-degree programmes)

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<table>
<thead>
<tr>
<th>Module title</th>
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<tbody>
<tr>
<td>Enterprise AI</td>
<td>12-M-EAI-221-m01</td>
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<tr>
<td>Holder of the Chair of Business Management and Business Information Systems</td>
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**Contents**

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**Intended learning outcomes**

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**Courses**

(type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment**

(type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or  
b) term paper (approx. 15 pages) or  
c) oral examination of one candidate each (approx. 20 minutes)  
Language of assessment: German and/or English creditable for bonus

**Allocation of places**

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**Additional information**

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**Referred to in LPO I**

(examination regulations for teaching-degree programmes)

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<table>
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<tr>
<td>Information Systems and Artificial Intelligence 1</td>
<td>12-M-KI1-221-m01</td>
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**Module coordinator**

Holder of the Chair of Business Management and Business Information Systems

**Module offered by**

Faculty of Business Management and Economics

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**Contents**

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**Intended learning outcomes**

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**Courses** (type, number of weekly contact hours, language — if other than German)

V (2) + Ü (2)

**Method of assessment** (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)

a) written examination (approx. 60 minutes) or
b) oral examination in groups of up to 3 candidates (approx. 10 minutes per candidate) or
c) term paper (approx. 15 to 20 pages)

Language of assessment: German and/or English

Assessment offered: In the semester in which the course is offered

**Allocation of places**

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**Additional information**

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**Referred to in LPO I** (examination regulations for teaching-degree programmes)

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Master's with 1 major Information Systems (2019)
Thesis
(30 ECTS credits)
### Module title

**Master Thesis Information Systems**

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<th>Abbreviation</th>
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<tr>
<td>12-WI-MA-192-m01</td>
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### Module coordinator

Dean of the Faculty of Business Management and Economics

### Module offered by

Faculty of Business Management and Economics

### ECTS

| 30 |

### Method of grading

numerical grade

### Only after succ. compl. of module(s)

--

### Duration

1 semester

### Module level

graduate

### Other prerequisites

--

## Contents

Students will complete their degree with a Master’s thesis in which they will be required to independently research and write on a topic in the area of business management and economics, drawing on the subject-specific knowledge they have acquired and adhering to the principles of good scientific practice. This thesis may either take the form of an analysis and structured presentation of the existing literature on a certain topic or may, as is often the case, also include a presentation of the students’ own original achievements, e. g. new algorithms developed by students, surveys, the prototypical demonstration of a concept they developed or the application and (further) development of a theoretical model.

## Intended learning outcomes

In the master thesis students prove that they can plan and carry out a science-based work to solve a particular problem within a specified period autonomously and to document the results in accordance with the professional scientific standards in writing. Students are able to understand relevant contributions to research and professional practice, critically analyze and assess the relevance to their own specific questions. They can assess and recognize major lines of development and dynamics of the subject and therefore also the need to retrain continuously.

## Courses

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## Method of assessment

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<thead>
<tr>
<th>type, scope, language</th>
<th>if other than German, examination offered</th>
<th>if not every semester, information on whether module is creditable for bonus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master’s thesis</td>
<td>approx. 60 to 80 pages</td>
<td>Language of assessment: German and/or English</td>
</tr>
</tbody>
</table>

## Allocation of places

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## Additional information

Time to complete: 6 months

## Referred to in LPO I

(examination regulations for teaching-degree programmes)