

Module Catalogue

for the Subject

Computer Science

as a Bachelor's with 1 major
with the degree "Bachelor of Science"
(180 ECTS credits)

Examination regulations version: 2010
Responsible: Institute of Computer Science

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The subject is divided into

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Content and Objectives of the Programme

The bachelor of science in computer science combining theoretical and practical elements is the first degree level offered by the Department of Mathematics and Computer Science at the Maximilian University of Würzburg.

The aim of this degree is to teach students the most important aspects of computer science, to understand the theory of algorithms and their application as well as to improve analytical skills, the ability to think in abstract terms and structure complex problems. With this degree the students have the skills to either continue their studies in a consecutive Master of Science program or be able to apply their knowledge in one of the many fields of computer science present outside academia. This is complemented by a specialization field in which the students become familiar with the basic techniques and ways of thinking in a subject of their choice for which methods of computer science are used.

The bachelor program focuses on well established and fundamental knowledge of facts and methods as well as on the development of thought processes necessary for computer science. Furthermore, state-of-the-art methods and their relevant applications are taught. With the bachelor thesis, students demonstrate their ability to work on a specific task and use the scientific methods learned within a defined period of time. Though guided by a mentor, they largely carry out the selected project on their own. The bachelor is an internationally acknowledged degree in the field of computer science that demonstrates the ability to work in this field or continue on to obtain a higher degree.

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:

ASPO2009

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

03-Aug-2010 (2010-42)

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

(86 ECTS credits)

Computer Science

(80 ECTS credits)

Module title		Abbreviation
Algorithm and data structures		10-I-ADS-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Design and analysis of algorithms, recursion vs. iteration, sort and search methods, data structures, abstract data types, lists, trees, graphs, basic graph algorithms, programming in Java.		
Intended learning outcomes		
The students are able to independently design algorithms as well as to precisely describe and analyse them. The students are familiar with the basic paradigms of the design of algorithms and are able to apply them in practical programs. The students are able to estimate the run-time behaviour of algorithms and to prove their correctness.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen § 69 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Master's degree (1 major) Digital Humanities (2011) First state examination for the teaching degree Realschule Computer Science (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 9 / 103

Module title		Abbreviation
Software Technology		10-I-ST-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Object-oriented software development with UML, development of graphical user interfaces, foundations of databases and object-relational mapping, foundations of web programming (HTML, XML), software development processes, unified process, agile software development, project management, quality assurance.		
Intended learning outcomes		
The students possess a fundamental theoretical and practical knowledge on the design and development of software systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. b) Datenbanksysteme und Softwaretechnologie § 69 (1) 1. b) Datenbanksysteme und Softwaretechnologie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Economathematics (2012) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Human-Computer Systems (2010) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009)		
Bachelor's with 1 major Computer Science (2010)		page 10 / 103
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Bachelor' degree (1 major) Aerospace Computer Science (2011)
First state examination for the teaching degree Realschule Computer Science (2012)
First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Practical Course in Programming		10-I-PP-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
The programming language Java. Independent creation of small to middle-sized, high-quality Java programs.		
Intended learning outcomes		
The students are able to independently develop small to middle-sized, high-quality Java programs.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
Additional information on module duration: 1 to 2 semesters.		
Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. c) Informatik Praktische Softwareentwicklung § 69 (1) 1. d) Informatik Praktische Softwareentwicklung		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Digital Humanities (2011) First state examination for the teaching degree Realschule Computer Science (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Practical course in software		10-I-SWP-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Completion of a project assignment in groups, problem analysis, creation of requirements specifications, specification of solution components (e. g. UML) and milestones, user manual, programming documentation, presentation and delivery of the runnable software product in a colloquium.		
Intended learning outcomes		
The students possess the practical skills for the design, development and execution of a software project in small teams.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
completion of project assignments, presentation		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. c) Informatik Praktische Softwareentwicklung		
§ 69 (1) 1. d) Informatik Praktische Softwareentwicklung		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010)		
Bachelor' degree (1 major) Mathematics (2012)		
Bachelor' degree (1 major) Mathematics (2013)		
Bachelor' degree (1 major) Computational Mathematics (2012)		
Bachelor' degree (1 major) Computational Mathematics (2013)		
First state examination for the teaching degree Realschule Computer Science (2012)		
First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Digital computer systems		10-I-RAL-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Introduction to digital technologies, Boolean algebras, combinatory circuits, synchronous and asynchronous circuits, hardware description languages, structure of a simple processor, machine programming, memory hierarchy.		
Intended learning outcomes		
The students possess a knowledge of the fundamentals of digital technologies up to the design and programming of easy microprocessors as well as knowledge for the application of hardware description languages for the design of digital systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Information Transmission		10-I-Ü-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science III		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Introduction to probability calculus, coding theory, coding for fault detection and fault correction, information theory, spectrum and Fourier transform, modulation technique, structure of digital transmission systems, introduction to the structure of computer networks, communication protocols.		
Intended learning outcomes		
The students possess a technical, theoretical and practical knowledge of the structure of systems for information transmission, a knowledge that is necessary to understand these systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Practical Course in Hardware		10-I-HWP-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor.		
Intended learning outcomes		
The students are able to independently review, prepare and perform experiments with the help of experiment descriptions, to independently search for additional information as well as to document and evaluate experiment results.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
completion of project assignments, presentation (type and expenditure of time to be specified by the lecturer at the beginning of the course)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) First state examination for the teaching degree Gymnasium Computer Science (2009) No final examination Special study offering (2010)		

Module title		Abbreviation
Theoretical informatics		10-I-TI-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Computability, decidability, countability, complexity of calculations, Boolean functions and circuits, finite automata and regular sets, generative grammars, context-free languages, context-sensitive languages.		
Intended learning outcomes		
The students possess fundamental and applicable knowledge in the area of computability, decidability, countability, complexity of calculations, Boolean functions and circuits, finite automata and regular sets, generative grammars, context free languages, context sensitive languages.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3.		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen § 69 (1) 1. a) Informatik Theoretische Informatik, Algorithmen und Datenstrukturen		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Realschule Computer Science (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Basics of Mathematics

(6 ECTS credits)

Module title		Abbreviation
Logic for informatics		10-I-LOG-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Syntax and semantics of propositional logic, equivalence and normal forms, Horn formulas, SAT, resolution, infinite formula sets, syntax and semantics of predicate logic.		
Intended learning outcomes		
The students are proficient in the following areas: syntax and semantics of propositional logic, equivalence and normal forms, Horn formulas, SAT, resolution, infinite formula sets, syntax and semantics of predicate logic.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Compulsory Electives

(62 ECTS credits)

Mathematics

(29 ECTS credits)

Module title			Abbreviation
Mathematics 1 and 2 for students in Computer Science			10-M-INF12-102-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Fundamentals on numbers and functions, sequences and series, differential and integral calculus in one variable, vector spaces, simple differential equations, linear maps and systems of linear equations, matrix calculus, eigenvalue theory, differential and integral calculus in several variables, differential equations, Fourier analysis.			
Intended learning outcomes			
The student gets acquainted with fundamental concepts and methods of advanced mathematics. He/She learns to apply these methods to problems in natural and engineering sciences, in particular in computer science, and is able to interpret the results.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-INF12-1-102: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-INF12-2-102: V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-INF12-1-102: Mathematics 1 for students in Computer Science Mathematics 1 for students in Computer Science <ul style="list-style-type: none">10 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.			
Assessment in module component 10-M-INF12-2-102: Mathematics 2 for students in Computer Science Mathematics 2 for students in Computer Science <ul style="list-style-type: none">10 ECTS, Method of grading: numerical gradewritten examination (approx. 90 to 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)			
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- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Computer Science (2010)

Module title		Abbreviation
Mathematics 3 for students in Computer Science		10-M-INF3-102-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
9	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.
Contents		
Elementary algebra and number theory: cardinality of sets, relations, maps, groups, fields, residue class rings and polynomial rings, prime numbers, basics in cryptography. Discrete mathematics: graph theory, combinatorics, integral optimisation and algorithmic applications. Discrete stochastics: combinatorics, basic notions in probability theory, random variables, expected value and variance, independency, Bayes' law, important distribution functions, Markov chains, tests.		
Intended learning outcomes		
The student gets acquainted with fundamental concepts and methods of advanced mathematics. He/She learns to apply these methods to problems in natural and engineering sciences, in particular in computer science, and is able to interpret the results.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 to 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Bachelor' degree (1 major) Computer Science (2010)

Module title			Abbreviation
Mathematics 1 and 2 for students of Space- and Aerospace Computer Science			10-M-LRI12-092-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
20	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Basics on numbers and functions, sequences and series, elementary functions, differential and integral calculus in one variable, vector calculus, linear maps and systems of linear equations, matrix calculus, eigenvalue theory, differential and integral calculus in several variables, differential equations, Fourier analysis, integral theorems.			
Intended learning outcomes			
The student gets acquainted with fundamental concepts and methods of mathematics. He/She learns to apply these methods to problems in natural and engineering sciences, in particular in aerospace computer science, and is able to interpret the results.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-LRI12-1-092: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-LRI12-2-092: V + Ü (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-LRI12-1-092: Mathematics 1 for students of Space- and Aerospace Computer Science Mathematics 1 for students of Space- and Aerospace Computer Science <ul style="list-style-type: none">10 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 to 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.			
Assessment in module component 10-M-LRI12-2-092: Mathematics 2 for students of Space- and Aerospace Computer Science Mathematics 2 for students of Space- and Aerospace Computer Science <ul style="list-style-type: none">10 ECTS, Method of grading: numerical gradewritten examination (approx. 90 to 120 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)			
Bachelor's with 1 major Computer Science (2010)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	
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- Language of assessment: German, English if agreed upon with the examiner
- Other prerequisites: Registration for the exercise must be made via SB@home at the beginning of the course or as announced by the lecturer in accordance with the specified registration deadlines. Certain prerequisites must be met to qualify for admission to assessment (e. g. successful completion of a certain percentage of exercises). The lecturer will inform students about the respective details at the beginning of the course. Registration for the exercise will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew and have to register anew, too.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Computer Science (2010)
Bachelor' degree (1 major) Aerospace Computer Science (2009)
Bachelor' degree (1 major) Aerospace Computer Science (2011)

Module title			Abbreviation
Analysis			10-M-ANA-o82-mo1
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
17	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Real numbers and completeness, basic topological notions, convergence and divergence of sequences and series, power series, Taylor series, fundamental calculus in one and several variables (including inverse and implicit function theorem); fundamental integral calculus in one variable (Riemann integral and improper integrals).			
Intended learning outcomes			
The student knows and masters the essential methods and notions of analysis. He/She is able to perform easy mathematical arguments and present them adequately in written and oral form. He/She is acquainted with the central proof methods and concepts in analysis, their analytic background and geometric interpretation.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-ANA-1-o82: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-ANA-2-o82: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-ANA-P-o82: M (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-ANA-1-o82: Analysis 1 Analysis 1 <ul style="list-style-type: none">8 ECTS, Method of grading: (not) successfully completeda) written examination (approx. 90 minutes; usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Modules 10-M-VKM and 10-M-PPM are recommended.			
Assessment in module component 10-M-ANA-2-o82: Analysis 2 Analysis 2 <ul style="list-style-type: none">7 ECTS, Method of grading: (not) successfully completeda) written examination (approx. 90 minutes; usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Modules 10-M-VKM and 10-M-PPM are recommended; in addition, module component 10-M-ANA-1 is recommended for module component 10-M-ANA-2.			
Assessment in module component 10-M-ANA-P-o82: Examination in Analysis <ul style="list-style-type: none">2 ECTS, Method of grading: numerical gradeoral examination of one candidate each (approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOnly after successful completion of module components: Successful completion of any one of the module components 10-M-ANA-1, 10-M-ANL-1, 10-M-ANA-2, 10-M-ANL-2 is a prerequisite for participation in module component 10-M-ANA-P.			

Allocation of places
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Additional information
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
§ 73 (1) 1. Mathematik Analysis
Module appears in
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Econometrics (2009) Bachelor' degree (1 major) Econometrics (2008) Bachelor' degree (1 major) Mathematical Physics (2009) Bachelor' degree (1 major) Computational Mathematics (2009) Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)

Module title			Abbreviation
Linear Algebra			10-M-LNA-o82-m01
Module coordinator		Module offered by	
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics	
ECTS	Method of grading	Only after succ. compl. of module(s)	
14	numerical grade	--	
Duration	Module level	Other prerequisites	
2 semester	undergraduate	By way of exception, additional prerequisites are listed in the section on assessments.	
Contents			
Sets, relations and maps; notions of groups, rings and fields (in particular, polynomial rings); vector spaces (subspaces, quotient spaces, linear independency, basis, dimension); linear maps (isomorphism theorem, image, kernel, rank); matrix calculus; systems of linear equations, determinants, eigenvalues, eigenvectors and eigenspaces, diagonalisability (including characteristic polynomial, minimal polynomial), normal forms, bilinear forms; Euclidean and unitary vector spaces (orthonormal bases, isometries, principal axis transformation).			
Intended learning outcomes			
The student knows and masters the basic notions and essential methods of linear algebra. He/She is able to perform easy mathematical arguments independently, and can present them adequately in written and oral form. He/She is able to apply the central proof methods and concepts of linear algebra and knows about their algebraic and geometric background.			
Courses (type, number of weekly contact hours, language — if other than German)			
This module comprises 3 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none">10-M-LNA-1-o82: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-LNA-2-o82: V + Ü (no information on SWS (weekly contact hours) and course language available)10-M-LNA-P-o82: M (no information on SWS (weekly contact hours) and course language available)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.			
Assessment in module component 10-M-LNA-1-o82: Linear Algebra 1 Linear Algebra 1 <ul style="list-style-type: none">7 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examinerOther prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.			
Assessment in module component 10-M-LNA-2-o82: Linear Algebra 2 Linear Algebra 2 <ul style="list-style-type: none">5 ECTS, Method of grading: (not) successfully completedwritten examination (approx. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes)Language of assessment: German, English if agreed upon with the examiner			
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- Other prerequisites: Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.

Assessment in module component 10-M-LNA-P-o82: Examination in Linear Algebra

- 2 ECTS, Method of grading: numerical grade
- oral examination of one candidate each (approx. 30 minutes)
- Language of assessment: German, English if agreed upon with the examiner
- Only after successful completion of module components: Successful completion of module component 10-M-LNA-1 or module component 10-M-LNA-2 is a prerequisite for participation in module component 10-M-LNA-P.

Allocation of places

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Additional information

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Workload

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Teaching cycle

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

§ 73 (1) 2. Mathematik Lineare Algebra, Algebra und Elemente der Zahlentheorie

Module appears in

Bachelor' degree (1 major) Computer Science (2010)
 Bachelor' degree (1 major) Mathematics (2008)
 Bachelor' degree (1 major) Econometrics (2009)
 Bachelor' degree (1 major) Econometrics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Computer Science

(23 ECTS credits)

Module title		Abbreviation
Algorithmic Graph Theory		10-I-GT-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
We discuss typical graph problems: We solve round trip problems, calculate maximal flows, find matchings and colourings, work with planar graphs and find out how the ranking algorithm of Google works. Using the examples of graph problems, we also become familiar with new concepts, for example how we model problems as linear programs or how we show that they are fixed parameter computable.		
Intended learning outcomes		
The students are able to model typical problems in computer science as graph problems. In addition, the participants are able to decide which tool from the course helps solve a given graph problem algorithmically. In this course, students learn in detail how to estimate the run time of given graph algorithms.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2010) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Databases		10-I-DB-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Relational algebra and complex SQL statements; database planning and normal forms; transaction management.		
Intended learning outcomes		
The students possess knowledge about database modelling and queries in SQL as well as transactions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes) if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 (1) 1. b) Datenbanksysteme und Softwaretechnologie § 69 (1) 1. b) Datenbanksysteme und Softwaretechnologie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Bachelor' degree (1 major) Functional Materials (2012) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
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Master's degree (1 major) Mathematics (2010)
 Master's degree (1 major) Physics (2010)
 Master's degree (1 major) Physics (2011)
 Master's degree (1 major) Nanostructure Technology (2011)
 Master's degree (1 major) Nanostructure Technology (2010)
 Master's degree (1 major) Computational Mathematics (2012)
 First state examination for the teaching degree Realschule Computer Science (2012)
 First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Knowledge-based Systems		10-I-WBS-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science VI		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Foundations in the following areas: knowledge management systems, knowledge representation, solving methods, knowledge acquisition, learning, guidance dialogue, semantic web.		
Intended learning outcomes		
The students possess theoretical and practical knowledge for the understanding and design of knowledge-based systems including knowledge formalisation and have acquired experience in a small project.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes) if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Computational Mathematics (2012) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Data Mining		10-I-DM-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science VI		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Foundations in the following areas: definition of data mining and knowledge, discovery in databases, process model, relationship to data warehouse and OLAP, data preprocessing, data visualisation, unsupervised learning methods (cluster and association methods), supervised learning (e. g. Bayes classification, KNN, decision trees, SVM), learning methods for special data types, other learning paradigms.		
Intended learning outcomes		
The students possess a theoretical and practical knowledge of typical methods and algorithms in the area of data mining and machine learning. They are able to solve practical knowledge discovery problems with the help of the knowledge acquired in this course and by using the KDD process. They have acquired experience in the use or implementation of data mining algorithms.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Computational Mathematics (2012)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 37 / 103

First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Object-oriented Programming		10-I-OOP-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Polymorphism, generic programming, meta programming, web programming, templates, document management.		
Intended learning outcomes		
The students are proficient in the different paradigms of object-oriented programming and have experience in their practical use.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011)		
Bachelor's with 1 major Computer Science (2010)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010
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Master's degree (1 major) Nanostructure Technology (2010)

Module title		Abbreviation
Theory of Complexity		10-I-KT-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Complexity measurements and classes, general relationships between space and time classes, memory consumption versus computation time, determinism versus indeterminism, hierarchical theorems, translation methods, P-NP problem, completeness problems, Turing reduction, interactive proof systems.		
Intended learning outcomes		
The students possess a fundamental and applicable knowledge in the areas of complexity measurements and classes, general relationships between space and time classes, memory consumption versus computation time, determinism versus indeterminism, hierarchical theorems, translation methods, P-NP problem, completeness problems, Turing reduction, interactive proof systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
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Master's degree (1 major) Mathematics (2010)
Master's degree (1 major) Computational Mathematics (2012)
First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Automation and Control Technology		10-I-AR-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science VII		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Overview of automation systems, fundamental principles of control technology, Laplace transformation, transfer function, plant, controller types, basic feedback loop, fundamental principles of control engineering, automata, structure of Petri nets, Petri nets for automisation, machine-related structure of processing computation machines, communication between process computers and periphery devices, software for automation systems, process synchronisation, process communication, real-time operating systems, real-time planning.		
Intended learning outcomes		
The students master the fundamentals of automation and control.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3. Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 43 / 103

Master's degree (1 major) Mathematics (2010)
 Master's degree (1 major) Physics (2010)
 Master's degree (1 major) Physics (2011)
 Master's degree (1 major) Nanostructure Technology (2011)
 Master's degree (1 major) Nanostructure Technology (2010)
 Master's degree (1 major) Computational Mathematics (2012)
 First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Operating Systems		10-I-BS-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science II		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Batch, time sharing, real-time virtual machines, system calls, processes and threads, cooperating processes, schedulers, process synchronisation, semaphores, monitors, critical regions, deadlocks, dynamic memory management, segmentation, paging, file systems, interfaces, directory structure, network file systems, hard drive organisation, basics of MS operating systems.		
Intended learning outcomes		
The students possess knowledge and practical skills in building and using essential parts of operating systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011) Master's degree (1 major) Nanostructure Technology (2011) Master's degree (1 major) Nanostructure Technology (2010)		

Module title		Abbreviation
Computer Architecture		10-I-RAK-102-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Instruction set architectures, command processing through pipelining, statical and dynamic instruction scheduling, caches, vector processors, multi-core processors.		
Intended learning outcomes		
The students master the most important techniques to design fast computers as well as their interaction with compilers and operating systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 (1) 1. c) Informatik Technische Informatik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009) Bachelor' degree (1 major) Aerospace Computer Science (2011) Master's degree (1 major) Computer Science (2010) Master's degree (1 major) Mathematics (2012) Master's degree (1 major) Mathematics (2010) Master's degree (1 major) Physics (2010) Master's degree (1 major) Physics (2011)		
Bachelor's with 1 major Computer Science (2010)		page 46 / 103
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Master's degree (1 major) Nanostructure Technology (2011)
Master's degree (1 major) Nanostructure Technology (2010)
Master's degree (1 major) Computational Mathematics (2012)

Module title		Abbreviation
Computer Networks and Communication Systems		10-I-RK-102-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science III		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Properties of computer and communication systems: data traffic in distributed systems. Performance analysis of computer networks and communication systems: problem statement and introduction to method architecture and structure of computer networks: network structure, network access, access methods, digital transfer hierarchies, dataflow control and traffic control, transfer network. Communication protocols: fundamental principles and ISO architecture models. Internet: structure and basic mechanism, TCP/IP, routing, network management. Mobile communication networks: fundamental concepts, GSM, UMTS. Future communication systems and networks.		
Intended learning outcomes		
The students possess an intricate knowledge of the structure of computer networks and communication systems as well as fundamental principles to rate these systems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 80 to 90 minutes). If announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups. A 80 to 90 minute written examination is equivalent to a 20 minute (approx.) oral examination of one candidate each, a 30 minute (approx.) oral examination in groups of 2 and a 40 minute (approx.) oral examination in groups of 3. Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013) Bachelor' degree (1 major) Computational Mathematics (2012) Bachelor' degree (1 major) Computational Mathematics (2013) Bachelor' degree (1 major) Aerospace Computer Science (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 48 / 103

Bachelor' degree (1 major) Aerospace Computer Science (2011)
 Master's degree (1 major) Computer Science (2010)
 Master's degree (1 major) Mathematics (2012)
 Master's degree (1 major) Mathematics (2010)
 Master's degree (1 major) Computational Mathematics (2012)
 First state examination for the teaching degree Gymnasium Computer Science (2009)

Module title		Abbreviation
Bioinformatics		07-BI-102-m01
Module coordinator		Module offered by
holder of the Chair of Bioinformatics		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: exercises (type and scope to be announced by the lecturer at the beginning of the course).
Contents		
Fundamental principles of bioinformatics.		
Intended learning outcomes		
Students are proficient in methods for the analysis of DNA and protein databases.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 50 to 60 minutes); if announced by the lecturer by four weeks prior to the examination date, the written examination can be replaced by an oral examination of one candidate each or an oral examination in groups (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Master's degree (1 major) Computer Science (2010)		

Subsidiary Subject

(10 ECTS credits)

Mathematics

(10 ECTS credits)

Module title		Abbreviation
Introduction to Discrete Mathematics		10-M-EDM-072-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Techniques from combinatorics, introduction to graph theory (including applications), cryptographic methods, error-correcting codes.		
Intended learning outcomes		
The student is acquainted with the fundamental concepts and results in discrete mathematics, masters the relevant proof techniques, is able to apply methods from number theory and algebra to discrete mathematics and realises the scope of applications of discrete structures.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 73 (1) 2. Mathematik Lineare Algebra, Algebra und Elemente der Zahlentheorie		
Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 53 / 103

Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Module title		Abbreviation
Numerical Mathematics 1		10-M-NM1-o82-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Solution of systems of linear equations and curve fitting problems, nonlinear equations and systems of equations, interpolation with polynomials, splines and trigonometric functions, numerical integration.		
Intended learning outcomes		
The student is acquainted with the fundamental concepts and methods in numerical mathematics, applies them to practical problems and knows about their typical fields of application.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 73 (1) 5. Mathematik Angewandte Mathematik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2009) Bachelor' degree (1 major) Physics (2012)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 55 / 103

Bachelor' degree (1 major) Physics (2008)
 Bachelor' degree (1 major) Technology of Functional Materials (2009)
 Bachelor' degree (1 major) Technology of Functional Materials (2010)
 Bachelor' degree (1 major) Nanostructure Technology (2010)
 Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor' degree (1 major) Aerospace Computer Science (2009)
 Bachelor' degree (1 major) Aerospace Computer Science (2011)
 Master's degree (1 major) Physics (2010)
 Master's degree (1 major) Physics (2011)
 Master's degree (1 major) Technology of Functional Materials (2010)
 Master's degree (1 major) Technology of Functional Materials (2009)
 Master's degree (1 major) Nanostructure Technology (2011)
 Master's degree (1 major) Nanostructure Technology (2010)
 Master's degree (1 major) Functional Materials (2012)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Module title		Abbreviation
Stochastics 1		10-M-ST1-o82-mo1
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
8	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Combinatorics, Laplace models, selected discrete distributions, elementary measure and integration theory, continuous distributions: normal distribution, random variable, distribution function, product measures and stochastic independence, elementary conditional probability, characteristics of distributions: expected value and variance, limit theorems: law of large numbers, central limit theorem.		
Intended learning outcomes		
The student is acquainted with fundamental concepts and methods in stochastics, applies these methods to practical problems and knows about the typical fields of application.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 73 (1) 3. Mathematik Stochastik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Economathematics (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 57 / 103

Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Module title		Abbreviation
Computeroriented Mathematics		10-M-COM-o82-mo1
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance of exercises (attendance monitored, a maximum of one incident of unexcused absence).
Contents		
Introduction to modern mathematical software for symbolic computation (e. g. Mathematica or Maple) and numerical computation (e. g. Matlab) to supplement the basic modules in analysis and linear algebra ((10-M-ANA or 10-M-ANL) and 10-M-LNA). Computer-based solution of problems in linear algebra, geometry, analysis, in particular differential and integral calculus; visualisation of functions.		
Intended learning outcomes		
The student learns the use of advanced modern mathematical software packages, and is able to assess their fields of application to solve mathematical problems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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 in the form of programming exercises (as specified at the beginning of the course) Assessment offered: once a year, summer semester Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 73 (1) 5. Mathematik Angewandte Mathematik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Physics (2010) Bachelor' degree (1 major) Physics (2009) Bachelor' degree (1 major) Physics (2012) Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010) Bachelor' degree (1 major) Nanostructure Technology (2010) Bachelor' degree (1 major) Economathematics (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 59 / 103

Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Master's degree (1 major) Physics (2010)
 Master's degree (1 major) Technology of Functional Materials (2010)
 Master's degree (1 major) Technology of Functional Materials (2009)
 Master's degree (1 major) Functional Materials (2012)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Module title		Abbreviation
Introduction to Number Theory		10-M-EZT-o82-mo1
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Elementary properties of divisability, prime numbers and prime number factorisation, modular arithmetics, prime tests and methods for factorisation, structure of the residue class rings, theory of quadratic remainder, quadratic forms, diophantine approximation and diophantine equations.		
Intended learning outcomes		
The student is acquainted with the fundamental concepts and methods of elementary number theory. He/She is able to apply these methods to practical problems, e.g., in cryptography.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes; usually chosen) or b) oral examination of one candidate each (approx. 20 minutes) or c) oral examination in groups (groups of 2, approx. 30 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Economathematics (2009)		

Module title		Abbreviation
Ordinary Differential Equations		10-M-ODE-o82-mo1
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Existence and uniqueness theorem; continuous dependence of solutions on initial values; systems of linear differential equations; matrix exponential series; linear differential equations of higher order.		
Intended learning outcomes		
The student is acquainted with the fundamental concepts and methods of the theory of ordinary differential equations. He/she is able to apply these methods to practical problems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Physics (2008) Bachelor' degree (1 major) Technology of Functional Materials (2009) Bachelor' degree (1 major) Technology of Functional Materials (2010)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 62 / 103

Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Aerospace Computer Science (2009)
 Bachelor' degree (1 major) Aerospace Computer Science (2011)
 Master's degree (1 major) Technology of Functional Materials (2010)
 Master's degree (1 major) Technology of Functional Materials (2009)
 Master's degree (1 major) Functional Materials (2012)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 Bachelor' degree (1 major) Technology of Functional Materials (2006)

Module title		Abbreviation
Operations Research		10-M-ORS-072-m01
Module coordinator		Module offered by
Dean of Studies Mathematik (Mathematics)		Institute of Mathematics
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Certain prerequisites must be met to qualify for admission to assessment. The lecturer will inform students about the respective details at the beginning of the course. Registration for the course will be considered a declaration of will to seek admission to assessment. If students have obtained the qualification for admission to assessment over the course of the semester, the lecturer will put their registration for assessment into effect. Students who meet all prerequisites will be admitted to assessment in the current or in the subsequent semester. For assessment at a later date, students will have to obtain the qualification for admission to assessment anew.
Contents		
Linear programming, duality theory, transport problems, integral linear programming, graph theoretic problems.		
Intended learning outcomes		
The student is acquainted with the fundamental methods in operations research, as required as a central tool for solving many practical problems especially in economics. He/She is able to apply these methods to practical problems, both theoretically and numerically.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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. 90 minutes); if announced by the lecturer, the written examination can be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups (groups of 2, approx. 30 minutes) Language of assessment: German, English if agreed upon with the examiner		
Allocation of places		
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Additional information		
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Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 73 (1) 5. Mathematik Angewandte Mathematik		
Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2008) Bachelor' degree (1 major) Mathematics (2007) Bachelor' degree (1 major) Economathematics (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 64 / 103

Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Mathematical Physics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Master's degree (1 major) Nanostructure Technology (2011)
 Master's degree (1 major) Nanostructure Technology (2010)
 Bachelor's degree (1 major, 1 minor) Mathematics (Minor, 2008)
 First state examination for the teaching degree Gymnasium Mathematics (2009)

Physics

(10 ECTS credits)

Module title		Abbreviation
Introduction to Physics for Students of Non-physics-related Minor Subjects		11-EFNF-072-m01
Module coordinator		Module offered by
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
7	numerical grade	--
Duration	Module level	Other prerequisites
2 semester	undergraduate	--
Contents		
Mechanics, vibration theory, thermodynamics, optics, science of electricity, Atomic and Nuclear Physics.		
Intended learning outcomes		
The students have knowledge of the principles of Physics.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + V (no information on SWS (weekly contact hours) and course language available)		
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. 120 minutes)		
Allocation of places		
Only as part of pool of general key skills (ASQ): 10 places. Places will be allocated by lot.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2007) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Chemistry (2007) Bachelor' degree (1 major) Chemistry (2008) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Geography (2007) Bachelor' degree (1 major) Geography (2008) Bachelor' degree (1 major) Geography (2010) Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2014) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Food Chemistry (2009) Bachelor' degree (1 major) Mathematics (2008)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 67 / 103

Bachelor' degree (1 major) Mathematics (2014)
 Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Mathematics (2007)
 Bachelor' degree (1 major) Biomedicine (2009)
 Bachelor' degree (1 major) Biomedicine (2013)
 Bachelor' degree (1 major) Computational Mathematics (2009)
 Bachelor' degree (1 major) Computational Mathematics (2014)
 Bachelor' degree (1 major) Computational Mathematics (2012)
 Bachelor' degree (1 major) Computational Mathematics (2013)
 Bachelor' degree (1 major) FOKUS Chemistry (2011)

Module title		Abbreviation
Practical Course Physics for Students of Non-physics-related Minor Subjects		11-PFNF-072-m01
Module coordinator		Module offered by
Managing Director of the Institute of Applied Physics		Faculty of Physics and Astronomy
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance, Atomic and Nuclear Physics.		
Intended learning outcomes		
The students have knowledge of the principles of Physics.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (no information on SWS (weekly contact hours) and course language available)		
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 test (approx. 15 minutes) during experiment and b) ungraded written examination (approx. 90 minutes)		
Allocation of places		
Only as part of pool of general key skills (ASQ): 10 places. Places will be allocated by lot.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Biochemistry (2011) Bachelor' degree (1 major) Biochemistry (2013) Bachelor' degree (1 major) Biochemistry (2009) Bachelor' degree (1 major) Biology (2011) Bachelor' degree (1 major) Biology (2007) Bachelor' degree (1 major) Biology (2010) Bachelor' degree (1 major) Chemistry (2007) Bachelor' degree (1 major) Chemistry (2008) Bachelor' degree (1 major) Chemistry (2010) Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Geography (2007) Bachelor' degree (1 major) Geography (2008) Bachelor' degree (1 major) Geography (2010) Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2014) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Food Chemistry (2009)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 69 / 103

Bachelor' degree (1 major) Biomedicine (2009)
Bachelor' degree (1 major) Biomedicine (2013)
Bachelor' degree (1 major) FOKUS Chemistry (2011)

Business Management and Economics

(10 ECTS credits)

Module title		Abbreviation
Introduction to Business Administration - Minor		12-NW-EBWL-092-m01
Module coordinator		Module offered by
holder of the Chair of Business Management, Banking and Finance		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	undergraduate	--
Contents		
The module will provide students with an insight into economics. The course will first discuss how markets work. The resulting market result - traded amounts and price - will be analysed and different starting points for economic policy measures (e. g. regulation of monopolies, introduction of minimum wages, environmental policy) will be discussed. Students will then acquire an overview of macroeconomic interrelationships. In this context, the course will focus on providing students with an understanding of business cycles (unemployment, inflation) and growth processes. Current issues such as monetary and fiscal policy in the euro area will also be discussed.		
Intended learning outcomes		
After completing the module, students should be able to describe the modern business economics as a scientific discipline in its institutional economic expression and to master appropriate level in their problem-solving techniques used on the character of an orientation session.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Chemistry (2009) Bachelor' degree (1 major) Geography (2007) Bachelor' degree (1 major) Geography (2008) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Political and Social Studies (2008)		

Module title			Abbreviation
Introduction to Economics - Minor			12-NW-EVWL-092-m01
Module coordinator		Module offered by	
holder of the Chair of Monetary Policy and International Economics		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	undergraduate	--	
Contents			
<p>The course offers basic insights into the principles of economics. We analyse how markets work, i. e. how consumers form their demand and how suppliers make production decisions. On the basis of first insights into market economies, we analyse why governments might want to intervene. In this context, we focus on monopoly, environmental issues and minimum wages in labour markets.</p> <p>In addition to micro topics, we also focus on macroeconomic aspects and analyse why we observe business cycles (unemployment, inflation) and long term economic growth. We also address topics related to monetary and fiscal policy in the euro area.</p>			
Intended learning outcomes			
<p>The students have a basic knowledge of economics , with which they can analyze complex economic relationships. They can deal critically with current economic policy issues and make an independent judgment. In addition, elementary mathematical techniques for solving micropores and macroeconomic models are mediated.</p>			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
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			
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Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Chemistry (2009)			
Bachelor' degree (1 major) Geography (2007)			
Bachelor' degree (1 major) Geography (2008)			
Bachelor' degree (1 major) Computer Science (2010)			
Bachelor' degree (1 major) Political and Social Studies (2008)			

Module title		Abbreviation
Financial Accounting		12-ExtUR-G-o82-m01
Module coordinator		Module offered by
holder of the Chair of Business Management and Business Taxation		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	undergraduate	--
Contents		
This course offers an introduction to the fundamentals of financial accounting, including the technique of double-entry book-keeping as well as the fundamentals of recognition, valuation and presentation of assets, liabilities and equity according to German commercial law.		
Intended learning outcomes		
Students acquire a basic understanding of the fundamentals of financial accounting. They are able to arrange, reproduce and apply this knowledge, i.e. they are able to solve simple accounting problems.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012) Bachelor' degree (1 major) Mathematics (2013)		
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Bachelor' degree (1 major) Business Management and Economics (2009)
 Bachelor' degree (1 major) Business Management and Economics (2008)
 Bachelor' degree (1 major) Business Management and Economics (2010)
 Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2012)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Business Information Systems (2009)
 Bachelor' degree (1 major) Business Information Systems (2008)
 Master's degree (1 major) China Business and Economics (2014)
 Master's degree (1 major) China Business and Economics (2012)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2008)

Module title			Abbreviation
Supply, Production and Operations Management. An Introduction			12-BPL-G-o82-m01
Module coordinator		Module offered by	
holder of the Chair of Business Management and Industrial Management		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	undergraduate	--	
Contents			
This course will provide students with an overview of fundamental processes in procurement, production and logistics and the related corporate functions as well as a model-based introduction to related planning procedures.			
Intended learning outcomes			
The students will be able to describe and discuss the objectives and major processes in the domains of corporate procurement, production and logistics as well as their interdependencies. Furthermore, they are capable of developing and applying basic planning models in these fields.			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
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			
Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.			
Additional information			
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Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Mathematics (2012)			
Bachelor's with 1 major Computer Science (2010)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 76 / 103

Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Business Management and Economics (2009)
 Bachelor' degree (1 major) Business Management and Economics (2008)
 Bachelor' degree (1 major) Business Management and Economics (2010)
 Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2012)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Business Information Systems (2009)
 Bachelor' degree (1 major) Business Information Systems (2008)
 Master's degree (1 major) China Business and Economics (2014)
 Master's degree (1 major) China Business and Economics (2012)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2008)

Module title		Abbreviation
Managerial Accounting		12-IntUR-G-o82-mo1
Module coordinator		Module offered by
holder of the Chair of Business Management and Accounting		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	undergraduate	--
Contents		
<p>Content: This course offers an introduction to aims and methods of managerial accounting (cost accounting).</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Managerial accounting and financial accounting 2. Managerial accounting: basic terms 3. Different types of costs 4. Cost centre accounting based on total costs 5. Job costing based on total costs 6. Cost centre accounting and job costing based on direct/variable costs 7. Budgeting and cost-variance analysis 8. Cost-volume-profit analysis 9. Cost information and operating decisions <p>Reading: Coenenberg/Fischer/Günther: Kostenrechnung und Kostenanalyse, Stuttgart. Friedl/Hofmann/Pedell: Kostenrechnung. Eine entscheidungsorientierte Einführung. (most recent editions)</p>		
Intended learning outcomes		
<p>After completing the course "Management Accounting and Control", the students will be able to</p> <ul style="list-style-type: none"> (i) set out the responsibilities of the company's internal accounting and control; (ii) define the central concepts of internal enterprise computing restriction and control and assign case studies the terms; (iii) apply the basic methods of internal corporate accounting and control on a full and cost base to idealized case studies of medium difficulty that calculate relevant costs and benefits and take on this basis a reasoned decision. 		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of</p>		
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subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.

Additional information

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Workload

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Teaching cycle

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

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Module appears in

Bachelor' degree (1 major) Computer Science (2010)
 Bachelor' degree (1 major) Mathematics (2012)
 Bachelor' degree (1 major) Mathematics (2013)
 Bachelor' degree (1 major) Business Management and Economics (2009)
 Bachelor' degree (1 major) Business Management and Economics (2008)
 Bachelor' degree (1 major) Business Management and Economics (2010)
 Bachelor' degree (1 major) Economathematics (2009)
 Bachelor' degree (1 major) Economathematics (2012)
 Bachelor' degree (1 major) Economathematics (2008)
 Bachelor' degree (1 major) Business Information Systems (2009)
 Bachelor' degree (1 major) Business Information Systems (2008)
 Master's degree (1 major) China Business and Economics (2014)
 Master's degree (1 major) China Business and Economics (2012)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2008)

Module title		Abbreviation
Investment and Finance. An Introduction		12-I&F-G-o82-m01
Module coordinator		Module offered by
holder of the Chair of Business Management, Banking and Finance		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	undergraduate	--
Contents		
<p>Content:</p> <p>This course offers an introduction to principles of financial mathematics, several methods of capital budgeting and principles of financial economics.</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Principles of financial mathematics 2. Fundamental concepts 3. Problems of investment and finance in one commodity world under certainty 4. Problems of investment and finance in one commodity world under uncertainty 5. Problems of investment and finance in many commodities world under uncertainty 6. Capital market and corporate financing in Germany 		
Intended learning outcomes		
<p>After completing the course "Principles of Investments and Finance", the students will be able</p> <p>(i) to understand the fundamentals in financial mathematics and solve several problems, e.g. via the PV approach;</p> <p>(ii) to address the central problems in intertemporal allocation given different capital market scenarios;</p> <p>(iii) to budget and calculate the optimal useful life given static and dynamic investment approaches under the consideration of several other investment opportunities and the capital market scenario, especially the influence of taxes.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
<p>Number of places: 405. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Computer Science (2010)</p> <p>Bachelor' degree (1 major) Mathematics (2012)</p> <p>Bachelor' degree (1 major) Mathematics (2013)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2009)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2008)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2010)</p> <p>Bachelor' degree (1 major) Econometrics (2009)</p> <p>Bachelor' degree (1 major) Econometrics (2012)</p> <p>Bachelor' degree (1 major) Econometrics (2008)</p> <p>Bachelor' degree (1 major) Business Information Systems (2009)</p> <p>Bachelor' degree (1 major) Business Information Systems (2008)</p> <p>Master's degree (1 major) China Business and Economics (2014)</p> <p>Master's degree (1 major) China Business and Economics (2012)</p> <p>Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)</p>

Module title		Abbreviation
Introduction to Business Informatics		12-EWiinf-G-o82-mo1
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	undergraduate	--
Contents		
<p>Content: This course offers an introduction to the essential aspects of business information systems.</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> 1. Integration of IT systems 2. From data processing to information processing 3. eCommerce and eGovernment 4. Functionality of IT technology 5. Application development principles 6. Intercommunication <p>Reading: Thome: Grundzüge der Wirtschaftsinformatik.</p>		
Intended learning outcomes		
<p>The course "Einführung in die Wirtschaftsinformatik" communicates</p> <p>(i) an overview of the different task fields of the business informations systems discipline;</p> <p>(ii) an understanding for recent developments in the discipline and related technologies.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
<p>Number of places: 640. No restrictions with regard to available places for Bachelor's students of Wirtschaftswissenschaft (Business Management and Economics), Wirtschaftsmathematik (Mathematics for Economics) and Wirtschaftsinformatik (Business Information Systems). The remaining places will be allocated to students of other subjects. Should the number of applications exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. Applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload
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Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Computer Science (2010)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2009)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2008)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2010)</p> <p>Bachelor' degree (1 major) Business Information Systems (2009)</p> <p>Bachelor' degree (1 major) Business Information Systems (2008)</p> <p>Master's degree (1 major) China Business and Economics (2014)</p> <p>Master's degree (1 major) China Business and Economics (2012)</p>

Module title		Abbreviation
Business Processes		12-GP-G-082-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	undergraduate	--
Contents		
<p>This course is aimed at students of Wirtschaftsinformatik (Business Information Systems) and Wirtschaftswissenschaft (Business Management and Economics) interested in the topic. The course is divided up into two parts. In the theoretical part, students will acquire the necessary theoretical knowledge that will serve as a basis for the practical part. The practical exercise will present students with an opportunity to apply their newly acquired knowledge by working with an SAP Business ByDesign system on case studies on the model company Al-mika. In this context, the human resources, purchasing, sales, service, project management and finance departments will be dealt with.</p> <p>The course will introduce students to business processes of an ERP system (Enterprise Resource Planning) using the example of SAP Business ByDesign. In addition to the basic principles, students will also become familiar with the processes and functionalities.</p>		
Intended learning outcomes		
<p>After completing the course, the students will be able to</p> <ol style="list-style-type: none"> 1. reflect technical principles and operational models of ERP systems, 2. understand the functionality of ERP systems and 3. perform and understand business processes within the ERP system SAP Business ByDesign. 		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü (no information on SWS (weekly contact hours) and course language available)		
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		
<p>Wirtschaftsinformatik (Business Information Systems) Bachelor's (180 ECTS): no restrictions. Other degree programmes: minimum 15 places. More places will be available provided there is enough capacity. Should the number of applications from students of other subjects exceed the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective subject; among applicants with the same number of ECTS credits, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot; applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. A waiting list will be maintained and places re-allocated as they become available.</p>		
Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)

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Module appears in

Bachelor' degree (1 major) Computer Science (2010)
 Bachelor' degree (1 major) Business Management and Economics (2009)
 Bachelor' degree (1 major) Business Management and Economics (2008)
 Bachelor' degree (1 major) Business Management and Economics (2010)
 Bachelor' degree (1 major) Econometrics (2009)
 Bachelor' degree (1 major) Econometrics (2012)
 Bachelor' degree (1 major) Econometrics (2008)
 Bachelor' degree (1 major) Business Information Systems (2009)
 Bachelor' degree (1 major) Business Information Systems (2008)
 Master's degree (1 major) China Business and Economics (2014)
 Master's degree (1 major) China Business and Economics (2012)
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)

Module title			Abbreviation
Forward and Reverse Business Engineering			12-FRBE-F-o82-m01
Module coordinator		Module offered by	
Business Integration Prof. Thome		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	undergraduate	--	
Contents			
<p>"Business Engineering" refers to the method and model-based design theory for companies in the information age. "Forward" refers to design methods (such as situation analysis, requirements analysis and business process modelling) that help implement a new solution. "Reverse" refers to approaches (such as the use and process analysis) that make it possible to improve or re-design existing structures and processes. Market requirements and technological innovation potential are typical reasons for the continuous transformation of a company. The resulting change needs to be implemented into the organisational structure, business processes and information systems.</p> <p>The course traces the implementation cycle of enterprise software from the point of view of a member of a project team. In addition to acquainting students with the theoretical basis of adaptation, the course will also discuss examples from practical projects.</p>			
Intended learning outcomes			
<p>The students know in detail the process of adaptation of business software libraries. They master the methods of Forward Engineering (such as situation analysis, requirement analysis, process modeling and business blueprint) and Reverse Engineering (Reverse Business Engineering) and their implementation in tools.</p>			
Courses (type, number of weekly contact hours, language — if other than German)			
V + Ü (no information on SWS (weekly contact hours) and course language available)			
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			
<p>Number of places: 50. Should the number of applications exceed the number of available places, places will be allocated as follows: (1) Bachelor's students of Wirtschaftsinformatik (Business 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 the number of applications exceeds the number of available places, places will be allocated among applicants from within this group according to the respective FSB (subject-specific provisions) regarding Section 7 Subsection 4 ASPO (general academic and examination regulations). (4) When places are allocated in accordance with (2) and the number of applications exceeds the number of available places, places will be allocated in a standardised procedure among all applicants irrespective of their subjects according to the following quotas: Quota 1 (50% of places): total number of ECTS credits already achieved in the respective degree subject; among applicants with the same number of ECTS credits achieved, places will be allocated by lot. Quota 2 (25% of places): number of subject semesters of the respective applicant; among applicants with the same number of subject semesters, places will be allocated by lot. Quota 3 (25% of places): allocation by lot. (5) Within the groups according to (1) and (2), applicants who already have successfully completed at least one module component of the respective module will be given preferential consideration. (6) Places on all courses of the module component with a restricted number of places will be allocated in the same procedure. (7) A waiting list will be maintained and places re-allocated as they become available.</p>			
Additional information			
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Workload			
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Bachelor's with 1 major Computer Science (2010)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 86 / 103

Teaching cycle
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Referred to in LPO I (examination regulations for teaching-degree programmes)
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Module appears in
<p>Bachelor' degree (1 major) Computer Science (2010)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2009)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2008)</p> <p>Bachelor' degree (1 major) Business Management and Economics (2010)</p> <p>Bachelor' degree (1 major) Economathematics (2009)</p> <p>Bachelor' degree (1 major) Economathematics (2008)</p> <p>Bachelor' degree (1 major) Business Information Systems (2009)</p> <p>Bachelor' degree (1 major) Business Information Systems (2008)</p> <p>Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2010)</p>

Linguistics

(10 ECTS credits)

Module title		Abbreviation
Level One Module Introduction to German Linguistics		04-DtLA-BM-SW-092-m01
Module coordinator		Module offered by
holder of the Chair of German Linguistics		Institute of German Studies
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance (a maximum of 2 incidents of unexcused absence) of courses (lectures excluded).
Contents		
<p>Within the lecture, this module aims to provide an overview and first introduction to the important parts of German linguistics. At the same time, the seminar that is a part of the module, provides students with analytical and description methods up to the word level, for example morphological segmentation and classification of individual word forms into basic morphemes, morphology and inflectional morphemes, morphological and semantic analysis of word formation structures, phonetic and phonological transcription in International Phonetic Alphabet (IPA)-phonetics, graphical realisation of phonemes and associated with orthography principles. The associated tutorial helps to practise further and to become more confident with the analytical and description methods, acquired in the seminar.</p>		
Intended learning outcomes		
<p>Students possess an overview of the discipline German linguistics and its individual subdisciplines. They are able to describe and analyse linguistic units up to the word level assuredly. Thanks to the module, students are familiar with the basic analytical and description techniques of linguistics, which will be extended and consolidated in the following modules.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
T + V + S (no information on SWS (weekly contact hours) and course language available)		
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		
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Additional information		
Additional information on module duration: 1 to 2 semesters.		
Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 43 (1) 2. b) Deutsch Deutsche Sprachwissenschaft (Nebengebiet)		
§ 63 (1) 2. b) Deutsch Deutsche Sprachwissenschaft (Nebengebiet)		
Module appears in		
<p>Bachelor' degree (1 major) Computer Science (2010) Bachelor's degree (1 major, 1 minor) German Language and Literature (2013) Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2013) Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2010) Bachelor's degree (1 major, 1 minor) German Language and Literature (2010) First state examination for the teaching degree Grundschule German (2009) First state examination for the teaching degree Hauptschule German (2009)</p>		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 89 / 103

First state examination for the teaching degree Realschule German (2009)
First state examination for the teaching degree Gymnasium German (2009)
First state examination for the teaching degree Mittelschule German (2013)
Bachelor's degree (2 majors) German Language and Literature (2013)
Bachelor's degree (2 majors) German Language and Literature (2009)

Module title			Abbreviation
Level Two Module Grammatical Structures of German			o4-DtLA-AM-SW1-092-mo1
Module coordinator		Module offered by	
holder of the Chair of German Linguistics		Institute of German Studies	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	Admission prerequisite to assessment: regular attendance (a maximum of 2 incidents of unexcused absence) of courses (lectures excluded).	
Contents			
Within the lecture, this module aims to provide an overview of the German syntax with focus on the valency grammatical sentence analysis, e.g. determining clauses by the use of grammatical samples, determining valency depending and non-depending clauses, syntactical function and semantics of relative clauses, formal description of the structure of complex sentences. During this module, which is a part of the seminar, students will practise the analytical and description methods, covered during the lecture, by authentic sentences. This module will start with the analysis of simple sentences, then goes over to levels of clauses and will continue with the analysis of difficult sentences up to sub-levels. The tutorial, which is a part of the module, provides further practise and students will be confident with the covered description and analytical methods.			
Intended learning outcomes			
Students possess solid knowledge of the sub-area syntax with focus on valency grammar, they are able to identify and determine syntactic structures and are acquainted with the description and analysis of linguistic units up to the sentence level assuredly.			
Courses (type, number of weekly contact hours, language — if other than German)			
T + V + S (no information on SWS (weekly contact hours) and course language available)			
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			
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Additional information			
Additional information on module duration: 1 to 2 semesters.			
Workload			
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Teaching cycle			
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Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 43 (1) 2. b) Deutsch Deutsche Sprachwissenschaft (Nebengebiet)			
§ 63 (1) 2. b) Deutsch Deutsche Sprachwissenschaft (Nebengebiet)			
Module appears in			
Bachelor' degree (1 major) Computer Science (2010)			
Bachelor's degree (1 major, 1 minor) German Language and Literature (2013)			
Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2013)			
Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2010)			
Bachelor's degree (1 major, 1 minor) German Language and Literature (2010)			
First state examination for the teaching degree Grundschule German (2009)			
First state examination for the teaching degree Hauptschule German (2009)			
First state examination for the teaching degree Realschule German (2009)			
Bachelor's with 1 major Computer Science (2010)		JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	
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First state examination for the teaching degree Gymnasium German (2009)
First state examination for the teaching degree Mittelschule German (2013)
Bachelor's degree (2 majors) German Language and Literature (2013)
Bachelor's degree (2 majors) German Language and Literature (2009)

Medicine

(10 ECTS credits)

Module title		Abbreviation
Medical decision making		03-M-MEI-072-m01
Module coordinator		Module offered by
Dean of Studies Medizin (Medicine)		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
This module will acquaint students with the fundamental principles of medical diagnostics and treatment and will apply these principles to the most important internal diseases. Students will work on casuistries presented on the computer in the form of virtual patients. The module will discuss the principles of medical word formation as well as the history and development of the language of medicine. It will explain medical word elements (prefixes, suffixes, genitive nouns, adjectives etc.) and will acquaint students with medical terminology. The course will also include exercises.		
Intended learning outcomes		
Students have developed a knowledge of fundamental medical terminology and medical decision making and are able to apply this knowledge to the example of internal medicine.		
Courses (type, number of weekly contact hours, language — if other than German)		
V + Ü + V (no information on SWS (weekly contact hours) and course language available)		
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 (60 minutes) or oral examination (one candidate each: 15 minutes, groups of 2: 20 minutes, groups of 3: 25 minutes)		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007)		
Bachelor' degree (1 major) Computer Science (2010)		

Geography

(10 ECTS credits)

Module title		Abbreviation
Remote Sensing		09-FERN-072-m01
Module coordinator		Module offered by
holder of the Chair of Remote Sensing		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Introduction to "Geographical Remote Sensing", applications of "Remote Sensing" to Geography.		
Intended learning outcomes		
Students possess the following skills: theoretical principles of the Remote Sensing System, knowledge of current geographical fields of application of cross-sectional methodology, remote sensing in the light of different sensor and platform specifications.		
Courses (type, number of weekly contact hours, language — if other than German)		
This module comprises 2 module components. Information on courses will be listed separately for each module component. <ul style="list-style-type: none"> 09-FERN-1-072: V + T (no information on SWS (weekly contact hours) and course language available) 09-FERN-2-072: V + T (no information on SWS (weekly contact hours) and course language available) 		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Assessment in this module comprises the assessments in the individual module components as specified below. Unless stated otherwise, successful completion of the module will require successful completion of all individual assessments.		
Assessment in module component 09-FERN-1-072: Introduction to Geographical Remote Sensing <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade written examination (45 minutes) Assessment in module component 09-FERN-2-072: Application of Remote Sensing in Geography <ul style="list-style-type: none"> 5 ECTS, Method of grading: numerical grade written examination (45 minutes) 		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Geography (2007) Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010)		
Bachelor's with 1 major Computer Science (2010)	JMU Würzburg • generated 26-Aug-2024 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2010	page 96 / 103

Bachelor' degree (1 major) Mathematics (2007)

Thesis

(12 ECTS credits)

Module title		Abbreviation
Bachelor-Thesis		10-I-BA-072-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
12	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	Registration for assessment: as specified.
Contents		
Largely independently researching and writing on an experimental or theoretical topic in computer science, using known methods and adhering to the principles of good scientific practice.		
Intended learning outcomes		
The students are able to largely independently research and write on an experimental or theoretical topic in computer science, applying known methods and adhering to the principles of good scientific practice, and to write a Bachelor's thesis.		
Courses (type, number of weekly contact hours, language — if other than German)		
no courses assigned		
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 thesis Language of assessment: German or English		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Business Information Systems (2007)		

Subject-specific Key Skills

(12 ECTS credits)

Module title		Abbreviation
Seminar 1		10-I-SEM1-072-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Independent review of a current topic in computer science on the basis of literature and, where applicable, software with written and oral presentation. The topics in modules 10-I-SEM1 and 10-I-SEM2 must come from different areas (this usually means that they are assigned by different lecturers).		
Intended learning outcomes		
The students are able to independently review a current topic in computer science, to summarise the main aspects in written form and to orally present these in an appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
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 elaboration and oral presentation with subsequent discussion on a topic from the field of computer science (type and length to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if required by the examination candidate		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007) Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Business Information Systems (2007) Bachelor' degree (1 major) Business Information Systems (2009) Bachelor' degree (1 major) Business Information Systems (2008) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Seminar 2		10-I-SEM2-072-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Independent review of a current topic in computer science on the basis of literature and, where applicable, software with written and oral presentation. The topics in modules 10-I-SEM1 and 10-I-SEM2 must come from different areas (this usually means that they are assigned by different lecturers).		
Intended learning outcomes		
The students are able to independently review a current topic in computer science, to summarise the main aspects in written form and to orally present these in an appropriate way.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (no information on SWS (weekly contact hours) and course language available)		
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 elaboration and oral presentation with subsequent discussion on a topic from the field of computer science (type and length to be specified by the lecturer at the beginning of the course) Language of assessment: German, English if required by the examination candidate		
Allocation of places		
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Additional information		
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Workload		
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Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2010) Bachelor' degree (1 major) Business Information Systems (2013) Bachelor' degree (1 major) Business Information Systems (2007) Bachelor' degree (1 major) Business Information Systems (2009) Bachelor' degree (1 major) Business Information Systems (2008) First state examination for the teaching degree Gymnasium Computer Science (2009)		

Module title		Abbreviation
Bachelor-Kolloquium		10-I-BK-072-m01
Module coordinator		Module offered by
Dean of Studies Informatik (Computer Science)		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
2	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
Presentation and defence of the results of the Bachelor's thesis in an open discussion.		
Intended learning outcomes		
The students are able to present the results of their Bachelor's theses and defend them in a discussion.		
Courses (type, number of weekly contact hours, language — if other than German)		
K (no information on SWS (weekly contact hours) and course language available)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
oral presentation (talk maximum 30 minutes, approx. 30 to 40 minutes total) with subsequent discussion of Bachelor's thesis and adjacent fields		
Allocation of places		
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Additional information		
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Workload		
--		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Bachelor' degree (1 major) Computer Science (2007)		
Bachelor' degree (1 major) Computer Science (2010)		