

# Module Catalogue

for the Subject

# Computer Science

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

Examination regulations version: 2025  
Responsible: Faculty of Mathematics and Computer Science  
Responsible: Institute of Computer Science

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## The subject is divided into

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## Learning Outcomes

German contents and learning outcome available but not translated yet.

### **Wissenschaftliche Befähigung**

- Die Absolventinnen und Absolventen können die mathematischen, technischen, theoretischen und praktischen Grundlagen der Informatik anwenden.
- Die Absolventinnen und Absolventen verstehen die wesentlichen Zusammenhänge und Konzepte der einzelnen Teilgebiete der Informatik.
- Die Absolventinnen und Absolventen können tiefergehende Kenntnisse in mindestens einem Teilgebiet abrufen.
- Die Absolventinnen und Absolventen können unter Anleitung hard- und/oder softwaregetriebene Experimente durchführen, analysieren, auswerten und die erhaltenen Ergebnisse darstellen.
- Die Absolventinnen und Absolventen sind in der Lage, sich mit Hilfe von Fachliteratur in neue Aufgabengebiete einzuarbeiten und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen besitzen Abstraktionsvermögen, analytisches Denken, Problemlösungskompetenz und die Fähigkeit, Zusammenhänge zu strukturieren.
- Die Absolventinnen und Absolventen sind in der Lage, Methoden der Informatik unter Anleitung auf konkrete praktische oder theoretische Aufgabenstellungen anzuwenden, Lösungswege zu entwickeln und die Ergebnisse zu interpretieren und zu bewerten.
- Die Absolventinnen und Absolventen setzen die erlernten theoretischen und praktischen Methoden in geschlossener Form unter Anleitung ein, um zu zeigen, dass sie zur Anwendung der Grundlagen wissenschaftlichen Arbeitens befähigt sind.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

### **Befähigung zur Aufnahme einer Erwerbstätigkeit**

- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.
- Die Absolventinnen und Absolventen sind in der Lage, konstruktiv und zielorientiert in einem Team zusammenzuarbeiten und auftretende Konflikte zu lösen (Teamfähigkeit).
- Die Absolventinnen und Absolventen können ihre erworbenen Kompetenzen in unterschiedlichen interkulturellen Kontexten und in international zusammengesetzten Teams anwenden.
- Die Absolventinnen und Absolventen kennen wichtige Anforderungen und Arbeitsweisen im gewerblichen Umfeld sowie in Forschung und Entwicklung.
- Die Absolventinnen und Absolventen sind befähigt, Probleme zu analysieren und zu lösen und sich in weniger vertraute Themenkomplexe einzuarbeiten.

### **Persönlichkeitsentwicklung**

- Eigenverantwortlichkeit, Selbstständigkeit, Zeitmanagement, Teamfähigkeit
- Die Absolventinnen und Absolventen kennen die Regeln guter wissenschaftlicher Praxis und beachten sie.
- Die Absolventinnen und Absolventen können ihr Wissen und ihre Erkenntnisse einem Fachpublikum gegenüber darstellen und vertreten.

### **Befähigung zum gesellschaftlichen Engagement**

- Die Absolventinnen und Absolventen können naturwissenschaftliche Entwicklungen kritisch reflektieren und deren Auswirkungen auf die Wirtschaft, Gesellschaft und die Umwelt in Ansätzen erfassen, zum Beispiel Technikfolgenabschätzung, Ethik, IT-Recht oder Datenschutz.
- Die Absolventinnen und Absolventen haben ihr Wissen bezüglich wirtschaftlicher, gesellschaftlicher, naturwissenschaftlicher, kultureller etc. Fragestellungen erweitert und können begründet Position beziehen.

- Die Absolventinnen und Absolventen entwickeln die Bereitschaft und Fähigkeit, ihre Kompetenzen in partizipative Prozesse einzubringen und aktiv an Entscheidungen mitzuwirken.

## Abbreviations used

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

Term: **SS** = summer semester, **WS** = winter semester

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

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

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

## Conventions

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

## Notes

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

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

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

## In accordance with

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

**ASPO2015**

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

**??-???-20?? (2025-??)**

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

(120 ECTS credits)



# Computer Science

(80 ECTS credits)

Module title		Abbreviation
Fundamentals of Programming		10-I-GdP-172-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	--
<b>Contents</b>		
Data types, control structures, foundations of procedural programming, selected topics of C, introduction to object orientation in Java, selected topics of C++, further Java concepts, digression: scripting languages.		
<b>Intended learning outcomes</b>		
The students possess a fundamental knowledge about programming languages (in particular Java, C and C++) and are able to independently develop average to high level Java programs.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 49 I Nr. 1 b) § 69 I Nr. 1 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Physics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Business Information Systems (2020) Bachelor's degree (1 major) Physics (2020) Bachelor's degree (1 major) Aerospace Computer Science (2020) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Business Information Systems (2021) Bachelor's degree (1 major) Mathematical Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)		
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Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Economathematics (2025)

Module title		Abbreviation
Algorithms and data structures		10-I-ADS-152-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	--
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		
Students are proficient in independently designing, precisely describing and analyzing algorithms. The students know the basic paradigms for the design of algorithms and can implement them in practical programs. Students are able to estimate the runtime behavior of algorithms and prove the correctness of algorithms.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
300 h		
Teaching cycle		
Teaching cycle: only in winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 I Nr. 1 a) § 69 I Nr. 1 a)		
Module appears in		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Economathematics (2015) Bachelor's degree (1 major) Human-Computer Systems (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) First state examination for the teaching degree Realschule Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017)		
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Bachelor's degree (1 major) Computer Science (2019)  
Bachelor's degree (1 major) Aerospace Computer Science (2020)  
Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
Bachelor's degree (1 major) Mathematics (2023)

Module title		Abbreviation
Software Engineering		10-I-SE-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 49 I Nr. 1 b) § 69 I Nr. 1 b)		
Module appears in		
Bachelor's degree (1 major) Economathematics (2025) Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Practical Course in Programming		10-I-PP-191-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
1-2 semester	undergraduate	Intended learning outcomes of the following module are required: 10-I-GdP. It is therefore strongly recommended to complete this before.
<b>Contents</b>		
The programming language Java. Independent creation of small to middle-sized, high-quality Java programs.		
<b>Intended learning outcomes</b>		
The students are able to independently develop small to middle-sized, high-quality Java programs.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (6)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
practical examination (programming exercises, approx. 240 hours) and written examination (approx. 60 to 120 minutes) If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 49 I Nr. 1 c) § 69 I Nr. 1 d)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Module studies (Bachelor) Orientierungsstudien (2020) Bachelor's degree (1 major) Aerospace Computer Science (2020) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Mathematics (2023)		

Module title		Abbreviation
Practical course in software		10-I-SWP-252-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	10-I-PP, 10-I-SE
Duration	Module level	Other prerequisites
1 semester	undergraduate	In addition, the knowledge and skills acquired in module 10-I-ADS are required. Prior attendance of this module is therefore highly recommended.
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 (6)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
practical project (Completion of a larger software project in groups (approx. 300 hours per person) and final presentation (approx. 10 minutes per group)		
Allocation of places		
--		
Additional information		
--		
Workload		
300 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 69 I Nr. 1 d)		
Module appears in		
keinem Studiengang zugeordnet		



Module title		Abbreviation
Digital computer systems		10-I-RAL-252-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	--
<b>Contents</b>		
Introduction to digital technologies, Boolean algebras, combinatory circuits, synchronous and asynchronous circuits, hardware description languages, structure of a simple processor, machine programming, memory hierarchy.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b), § 69 I Nr. 1 c)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Computer Networks and Information Transmission		10-I-RIÜ-191-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	--
Contents		
<ul style="list-style-type: none"> <li>• Computer networks and the Internet: Structure and Mechanisms of Telecommunication</li> <li>• Communication Protocols: Basic Principles and the Layer Model</li> <li>• Computer and Communication Systems: Network Systems, Data Traffic in Distributed Systems and inter-network Communication</li> <li>• The Internet: Important Protocols and Routing</li> <li>• Architecture and Structure of Computer Networks: Network Architecture, Access Mechanisms, Flow Control and Traffic Management</li> <li>• Coding Theory: Mechanisms for Error Detection and Error Correction</li> <li>• Information Theory: Entropy of Data</li> <li>• Digital Communication Systems: Signal Modulation</li> </ul>		
Intended learning outcomes		
Students command the technical, theoretical as well as practical knowledge to understand the structure of computer networks, the Internet and communication systems for telecommunication.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
300 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b), § 69 I Nr. 1 c)		
Module appears in		
<p>Bachelor's degree (1 major) Computer Science (2019)</p> <p>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Bachelor's degree (1 major) Aerospace Computer Science (2020)</p> <p>Bachelor's degree (1 major) Computer Science und Sustainability (2021)</p>		
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Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title			Abbreviation
Databases			10-I-DB-152-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			
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 (2) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 49 I Nr. 1 b) § 69 I Nr. 1 b)			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Business Information Systems (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) Bachelor's degree (1 major) Functional Materials (2015) First state examination for the teaching degree Realschule Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Master's degree (1 major) Physics (2016) Bachelor's degree (1 major) Business Information Systems (2016) Bachelor's degree (1 major) Aerospace Computer Science (2017)			
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Bachelor's degree (1 major) Computer Science (2017)  
 Bachelor's degree (1 major) Computer Science (2019)  
 Bachelor's degree (1 major) Business Information Systems (2019)  
 Bachelor's degree (1 major) Business Information Systems (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major) Functional Materials (2021)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Business Information Systems (2021)  
 Bachelor's degree (1 major) Mathematical Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Functional Materials (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Introduction into Human-Computer Interaction		10-I-MCS-242-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science IX		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		
<p>Human-Computer Interaction studies the design, evaluation, and implementation of interactive computer systems. Special focus lies on fundamental psychological and physiological properties of the human users, the technical principals and models of modern computer systems, as well as on the derived boundary conditions of designing usable and human-oriented interactions with technical systems. The topics of this course cover the human perception and cognition, the human memory and attention, the design of interactive systems, popular evaluation methods, principles of computer systems, input processing techniques, human interfaces and typical means of interaction, from text-based input methods over graphical user interfaces to multi-modal interfaces. Accompanying practical tasks convey to the students typical methods of requirement analysis, prototyping and evaluation.</p>		
Intended learning outcomes		
<p>After successfully completing this course, students have a fundamental understanding of human-computer interface design principles. They understand the possibilities and limitations of technology and user and the applications of modern user interfaces. They know the necessary steps of user-centric design and typical design principles.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V (3) + Ü (1)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>a) written examination (approx. 120 minutes) or b) presentation (30 to 60 minutes) or c) oral examination of one candidate each (30 to 60 minutes) Language of assessment: German and/or English creditable for bonus</p>		
Allocation of places		
--		
Additional information		
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Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
<p>Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024) Bachelor's degree (1 major) Games Engineering (2025)</p>		

Module title		Abbreviation
Practical course in hardware		10-I-HWP-152-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	--
<b>Contents</b>		
Practical experiments on hardware aspects, for example in communication technology, robots or the structure of a complete microprocessor.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (6)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
portfolio: completion of approx. 3 to 10 project assignments (approx. 250 hours total) and presentation of results (approx. 10 minutes per project)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Bachelor's degree (1 major) Aerospace Computer Science (2020)		
Bachelor's with 1 major Computer Science (2025)		page 23 / 150

Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)



# Theoretical Informatics

(10 ECTS credits)

Module title		Abbreviation
Theory of Computation		10-I-TI-242-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	--
<b>Contents</b>		
Computability, decidability, countability, finite automata, regular sets, generative grammars, context-free languages, context-sensitive languages, complexity of calculations, P-NP problem, NP completeness.		
<b>Intended learning outcomes</b>		
The students possess a fundamental and applicable knowledge in the areas of computability, decidability, countability, finite automata, regular sets, generative grammars, context-free languages, context-sensitive languages, complexity of computations, P-NP problem, NP completeness.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 49 I Nr. 1 a) § 69 I Nr. 1 a)		
<b>Module appears in</b>		
Module studies (Bachelor) Orientierungsstudien (2020) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025) Bachelor's degree (1 major) Games Engineering (2025)		

# Mathematics

(30 ECTS credits)

Module title		Abbreviation
Logic for informatics		10-I-LOG-152-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		
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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>Language of assessment: German and/or English</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
<p>Bachelor's degree (1 major) Computer Science (2015)</p> <p>Bachelor's degree (1 major) Mathematics (2015)</p> <p>Bachelor's degree (1 major) Computational Mathematics (2015)</p> <p>First state examination for the teaching degree Gymnasium Computer Science (2015)</p> <p>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)</p> <p>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)</p> <p>Bachelor's degree (1 major) Computer Science (2017)</p> <p>Bachelor's degree (1 major) Computer Science (2019)</p> <p>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Bachelor's degree (1 major) Aerospace Computer Science (2020)</p>		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 28 / 150

Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
<b>Mathematics 1 for students in Computer Science</b>		10-M-INF1-152-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)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
Propositional logic, set theory, proof techniques, relations; sequences, limits and lambda-symbols; the ring of integers; elementary group theory; residue class rings; basics in linear algebra, linear maps and matrix calculus, systems of linear equations.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2) Module taught in: Ü: German or English		
<b>Method of assessment</b> (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 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) exchange program Mathematics (2023)		

Module title			Abbreviation
Mathematics 2 for students in Computer Science			10-M-INF2-152-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
Determinants, eigenvalue theory; event and probability spaces, combinatorics, random variables, examples of distributions, parameter estimates; basics in 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)			
V (4) + Ü (2) Module taught in: Ü: German or English			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) exchange program Mathematics (2023)			

Module title		Abbreviation
Algorithmic Graph Theory		10-I-AGT-152-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science I		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		
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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017)		
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 Module studies (Bachelor) Computer Science (2019)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

## Compulsory Electives

(30 ECTS credits)

## **Software technology and artificial intelligence**

(5 ECTS credits)

Module title		Abbreviation
Model-based Systems Engineering		10-I-MSE-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Introduction to AI		10-I-AI-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of exam: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
keinem Studiengang zugeordnet		

Module title		Abbreviation
Data Science		10-I-DM-242-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: 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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Games Engineering (2025)		

# Computer Science

(15 ECTS credits)

Module title		Abbreviation
IT Security		10-I-SEC-191-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	--
Contents		
<p>The course provides a broad sweep through concepts and technologies related to IT security:</p> <ul style="list-style-type: none"> <li>• Theoretical aspects: information-theoretic security, computational security, introduction to cryptography (historical and modern ciphers, hash functions, pseudo-random generators, message authentication codes, public key cryptography)</li> <li>• Network security: protocol security, security of TCP/IP, public key infrastructure, user authentication</li> <li>• Software security: Software vulnerabilities, common programming errors and exploitation techniques, reverse engineering and obfuscation, malware and anti-malware</li> <li>• Platform security: access control models, security policies, operating system security, virtualization, security mechanisms with support in hardware</li> </ul>		
Intended learning outcomes		
<p>Students will be introduced to the main concepts and abstractions of IT security. They learn how to model threats and analyze security of a system critically from the attacker view point. After visiting the lecture students are going to understand the purpose and function of several security technologies, as well as their limitations. The exercises provide some hands-on experience of security flows in software.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
<p>V (2) + Ü (2) Module taught in: German and/or English</p>		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
<p>Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019)</p>		
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Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Interactive Computer Graphics		10-I-ICG-152-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science IX		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		
Computer graphics studies methods for digitally synthesising and manipulating visual content. This course specifically concentrates on interactive graphics with an additional focus on 3D graphics as a requirement for many contemporary as well as for novel human-computer interfaces and computer games. The course will cover topics about light and images, lighting models, data representations, mathematical formulations of movements, projection as well as texturing methods. Theoretical aspects of the steps involved in ray-tracing and the raster pipeline will be complemented by algorithmical approaches for interactive image syntheses using computer systems. Accompanying software solutions will utilise modern graphics packages and languages like OpenGL, GLSL and/or DirectX.		
Intended learning outcomes		
At the end of the course, the students will have a broad understanding of the underlying theoretical models of computer graphics. They will be able to implement a prominent variety of these models, to build their own interactive graphics applications and to choose the right software tool for this task.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
First state examination for the teaching degree Gymnasium Computer Science (2015) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 42 / 150

Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Module title		Abbreviation
Model-based Systems Engineering		10-I-MSE-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Introduction to AI		10-I-AI-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of exam: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
keinem Studiengang zugeordnet		

Module title		Abbreviation
Data Science		10-I-DM-242-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: 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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
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Additional information		
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Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Deep Learning		10-I-DL-222-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	--
<b>Contents</b>		
<p>The lecture provides advanced knowledge of deep learning techniques such as FCN, CNN and LSTMs, practical application examples for NN architectures, e.g. in the field of image and speech processing. Current models and methods of machine learning and their technical background are presented. Building on this, models from the field of deep learning, such as CNNs, RNNs and sequence-to-sequence architectures, are discussed. The theoretical foundations of these models, such as training through backpropagation, are also discussed in detail. For all the models covered, it is shown how they are used in practice for specific problems such as image processing and text generation.</p>		
<b>Intended learning outcomes</b>		
<p>Students have knowledge of the possible applications and limitations of deep learning, of important architectures and how they are implemented in tools such as Tensorflow/Keras, of the ability to reprogram network structures from the literature, of data preparation and of solving concrete tasks.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus</p>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
<p>Bachelor's degree (1 major) Mathematical Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024) Bachelor's degree (1 major) Games Engineering (2025)</p>		

Module title		Abbreviation
Theory of Machine Learning		10-I-TML-222-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	--
<b>Contents</b>		
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<b>Intended learning outcomes</b>		
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<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2) Module taught in: German and/or English		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Mathematical Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024) Bachelor's degree (1 major) Games Engineering (2025)		



Module title		Abbreviation
Advanced Programming		10-I-APR-172-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	--
<b>Contents</b>		
<p>With the knowledge of basic programming, taught in introductory lectures, it is possible to realize simpler programs. If more complex problems are to be tackled, suboptimal results like long, incomprehensible functions and code duplicates occur. In this lecture, further knowledge is to be conveyed on how to give programs and code a sensible structure. Also, further topics in the areas of software security and parallel programming are discussed.</p>		
<b>Intended learning outcomes</b>		
<p>Students learn advanced programming paradigms especially suited for space applications. Different patterns are then implemented in multiple languages and their efficiency measured using standard metrics. In addition, parallel processing concepts are introduced culminating in the use of GPU architectures for extremely quick processing.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus</p>		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
<p>Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Master's degree (1 major) Nanostructure Technology (2020) Master's degree (1 major) Physics (2020) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p>		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 49 / 150

Bachelor's degree (1 major) Business Information Systems (2020)  
 Master's degree (1 major) Physics International (2020)  
 Master's degree (1 major) Quantum Engineering (2020)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Master's degree (1 major) Quantum Technology (2021)  
 Bachelor's degree (1 major) Business Information Systems (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Master's degree (1 major) Quantum Engineering (2024)  
 Master's degree (1 major) Physics International (2024)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Computational Complexity		10-I-KT-191-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		
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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>Language of assessment: German and/or English</p> <p>Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
<p>Bachelor's degree (1 major) Computer Science (2019)</p> <p>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)</p> <p>Bachelor's degree (1 major) Computer Science und Sustainability (2021)</p> <p>Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)</p> <p>Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)</p> <p>Bachelor's degree (1 major) Mathematics (2023)</p> <p>Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)</p>		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 51 / 150

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Cryptography and Data Security		10-I-KD-191-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	--
<b>Contents</b>		
Private key cryptography systems, Vernam one-time pad, AES, perfect security, public key cryptography systems, RSA, Diffie-Hellman, Elgamal, Goldwasser-Micali, digital signature, challenge-response methods, secret sharing, millionaire problem, secure circuit evaluation, homomorphous encryption.		
<b>Intended learning outcomes</b>		
The students possess a fundamental and applicable knowledge in the areas of private key cryptography systems, Vernam one-time pad, AES, perfect security, public key cryptography, RSA, Diffie-Hellman, Elgamal, Goldwasser-Micali, digital signature, challenge-response method, secret sharing, millionaire problem, secure circuit evaluation, homomorphous encryption		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus		
<b>Allocation of places</b>		
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<b>Additional information</b>		
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<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Mathematics (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 53 / 150

Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
3D Point Cloud Processing		10-I-3D-152-m01
Module coordinator		Module offered by
holder of the Chair of Computer Science XVII		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	--
<b>Contents</b>		
Laser scanning, Kinect and camera models, basic data structures (lists, arrays, oc-trees), calculating normals, k-d trees, registration, features, segmentation, tracking, applications for airborne mapping, applications to mobile mapping.		
<b>Intended learning outcomes</b>		
Students understand the fundamental principles of all aspects of 3D point cloud processing and are able to communicate with engineers / surveyors / CV people / etc. Students are able to solve problems of modern sensor data processing and have experienced that real application scenarios are challenging in terms of computational requirements, in terms of memory requirements and in terms of implementation issues.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
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<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 55 / 150

Bachelor's degree (1 major) Computer Science (2019)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)



Module title		Abbreviation
Operating Systems		10-I-BS-242-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	--
Contents		
Introduction to computer systems, development of operating systems, architecture principles, interrupt processing in operating systems, processes and threads, CPU scheduling, synchronisation and communication, memory management, device and file management, operating system virtualisation.		
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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b), § 69 I Nr. 1 c)		
Module appears in		
Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Computer Architecture		10-I-RAK-152-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		
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 (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>Language of assessment: German and/or English</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
<p>§ 22 II Nr. 3 b)</p> <p>§ 69 I Nr. 1 c): Rechnerarchitektur</p>		
Module appears in		
<p>Bachelor's degree (1 major) Computer Science (2015)</p> <p>Bachelor's degree (1 major) Mathematics (2015)</p> <p>Bachelor's degree (1 major) Computational Mathematics (2015)</p> <p>Bachelor's degree (1 major) Aerospace Computer Science (2015)</p> <p>First state examination for the teaching degree Gymnasium Computer Science (2015)</p> <p>Master's degree (1 major) Physics (2016)</p> <p>Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016)</p> <p>Bachelor's degree (1 major) Aerospace Computer Science (2017)</p> <p>Bachelor's degree (1 major) Computer Science (2017)</p> <p>Bachelor's degree (1 major) Computer Science (2019)</p>		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 58 / 150

Master's degree (1 major) Physics (2020)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020)  
 Master's degree (1 major) Physics International (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Master's degree (1 major) Physics International (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Control Principles of Modern Communication Systems		10-I-SKS-242-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)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<ul style="list-style-type: none"> <li>Control Mechanisms of Modern Communication Systems</li> <li>Multimedia Networking</li> <li>Broadband Access Networks</li> <li>Mobile Communication Systems</li> <li>Home Access Networks</li> <li>Current trends such as Internet of Things (IoT)</li> <li>Software Defined Networking (SDN)</li> <li>Control mechanisms implemented and deployed on the Internet</li> <li>Introduction of analytical performance evaluation</li> </ul>		
Intended learning outcomes		
The students possess advanced knowledge regarding the structure, architecture and control mechanisms of modern communication systems and are able to apply it to evaluate systems and protocols within simulations and measurement setups. In addition, students have gathered insights of the basic methodologies in the field of analytical performance evaluation.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>Language of assessment: German and/or English</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
<p>Module studies (Bachelor) Computer Science (2019)</p> <p>Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)</p>		

Module title		Abbreviation
Audio Signal Processing		10-GE-ASP-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
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Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2) Module taught in: German or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
Bachelor's degree (1 major) Games Engineering (2025)		

Module title		Abbreviation
Introduction to Optimization		10-I-EidO-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2) Module taught in: German or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of exam: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
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Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
keinem Studiengang zugeordnet		

Module title		Abbreviation
Modeling and Simulation		10-I-MuS-212-m01
Module coordinator		Module offered by
holder of the Professorship for modeling and simulation		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	--
<b>Contents</b>		
Modeling and simulation play a central role in computer science and in the natural sciences for the analysis of systems. The module includes basic modeling paradigms, basics of simulation (discrete, continuous, hybrid, parallel), its implementation and evaluation.		
<b>Intended learning outcomes</b>		
The students learn the basics of various modeling formalisms and types of simulations as well as their application. They will acquire the skills to translate these systems into models for given problems and tasks, to develop simulation scenarios with suitable software, and to carry out and analyze simulation studies.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes) if announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
Teaching cycle: every year, winter semester		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science und Sustainability (2021)		

Module title		Abbreviation
Selected Basics of Computer Science		10-I-GI-152-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	--
<b>Contents</b>		
Selected topics in computer science.		
<b>Intended learning outcomes</b>		
The students are able to understand solutions to fundamental problems in computer science and to transfer them to related topics.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 120 minutes). If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Mathematics (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		



## **subsidiary subject**

( ECTS credits)

Students must select one of the minors offered and must achieve the required number of ECTS credits in this minor.

# Mathematics

( ECTS credits)

Module title			Abbreviation
Introduction to Discrete Mathematics for students of other subjects			10-M-DIMaf-152-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
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 (4) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			

Module title			Abbreviation
Numerical Mathematics 1 for students of other subjects			10-M-NUM1af-152-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
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 (4) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Physics (2015) Bachelor's degree (1 major) Nanostructure Technology (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) Bachelor's degree (1 major) Functional Materials (2015) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Physics (2020) Bachelor's degree (1 major) Nanostructure Technology (2020) Bachelor's degree (1 major) Aerospace Computer Science (2020) Bachelor's degree (1 major) Functional Materials (2021)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	
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Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Quantum Technology (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Functional Materials (2025)

Module title			Abbreviation
Stochastics 1 for students of other subjects			10-M-STO-1af-152-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
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 (4) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			

Module title		Abbreviation
Introduction Into Number Theory for students of other subjects		10-M-ZTHaf-152-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)
10	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
Elementary properties of divisibility, 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.		
<b>Intended learning outcomes</b>		
The student is acquainted with the fundamental concepts and methods of number theory. He/she is able to employ the basic methods and proof techniques independently.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + Ü (2)		
<b>Method of assessment</b> (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 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		

Module title			Abbreviation
Ordinary Differential Equations for students of other subjects			10-M-DGLaf-152-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
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 (4) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Aerospace Computer Science (2015) Bachelor's degree (1 major) Functional Materials (2015) Bachelor's degree (1 major) Aerospace Computer Science (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Aerospace Computer Science (2020) Bachelor's degree (1 major) Functional Materials (2021) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			
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Bachelor's degree (1 major) Functional Materials (2025)

Module title		Abbreviation
Mathematical Foundations of Data Science 1		10-M-MFD1-252-m01
Module coordinator		Module offered by
--		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	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (1)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
<p>written examination (approx. 60 to 120 minutes).</p> <p>If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate).</p> <p>Language of assessment: German and/or English</p> <p>creditable for bonus</p>		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
keinem Studiengang zugeordnet		

Module title			Abbreviation
Optimization for Machine Learning			10-M-OML-222-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)	
10	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
Linear programming, quadratic programming, convex optimization, first order methods, application to machine learning problems such as support vector machines.			
Intended learning outcomes			
The student is acquainted with the relevant methods in optimization and is able to apply these methods to practical machine learning problems, both theoretically and numerically.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (4) + Ü (2) Module taught in: German and/or English			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
a) written examination (approx. 90 to 180 minutes, usually chosen) or b) oral examination of one candidate each (15 to 30 minutes) or c) oral examination in groups (groups of 2, 10 to 15 minutes per candidate) Language of assessment: German and/or English Assessment offered: In the semester in which the course is offered and in the subsequent semester creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
300 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Economathematics (2022) Bachelor's degree (1 major) Mathematical Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) exchange program Mathematics (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Economathematics (2023) Bachelor's degree (1 major) Mathematical Physics (2024) Master's degree (1 major) Physics International (2024) Bachelor's degree (1 major) Economathematics (2024) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 75 / 150

Bachelor's degree (1 major) Economathematics (2025)

# Physics

( ECTS credits)

Module title		Abbreviation
Introduction to Physics for Students of other Disciplines		11-EFNF-152-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	--
<b>Contents</b>		
Fundamentals of mechanics, vibration theory, thermodynamics, optics, science of electricity, atomic and nuclear physics.		
<b>Intended learning outcomes</b>		
The students are able to identify fundamental physical contexts. They are able to assign them to corresponding fields in physics. They are able to apply simple formulae in order to analyse and evaluate these contexts.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (4) + V (3)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (60 to 120 minutes)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
according to § 2 para. 2 sentence 2 APOLmCh in conjunction with No. I 2nd letter d) and No. I 1st letter d) of annex 1 to the APOLmCh and No. 4 of annex 2 to the APOLmCh		
<b>Workload</b>		
210 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Biology (2011) Bachelor's degree (1 major) Chemistry (2010) Bachelor's degree (1 major) Psychology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2013) Bachelor's degree (1 major, 1 minor) Political and Social Studies (2013) Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2008) Bachelor's degree (2 majors) Special Education (2009) Magister Theologiae Catholic Theology (2013) First state examination for the teaching degree Gymnasium English (2009) First state examination for the teaching degree Gymnasium Biology (2009) First state examination for the teaching degree Gymnasium Chemistry (2009) First state examination for the teaching degree Gymnasium Geography (2009) First state examination for the teaching degree Gymnasium French Studies (2009) First state examination for the teaching degree Gymnasium German (2009) First state examination for the teaching degree Gymnasium History (2009)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 78 / 150

First state examination for the teaching degree Gymnasium Greek Philology (2009)  
 First state examination for the teaching degree Gymnasium Computer Science (2009)  
 First state examination for the teaching degree Gymnasium Italian Studies (2009)  
 First state examination for the teaching degree Gymnasium Catholic Theology (2009)  
 First state examination for the teaching degree Gymnasium Latin Philology (2009)  
 First state examination for the teaching degree Gymnasium Mathematics (2012)  
 First state examination for the teaching degree Gymnasium Mathematics (2009)  
 First state examination for the teaching degree Gymnasium Music (2009)  
 First state examination for the teaching degree Gymnasium Physics (2009)  
 First state examination for the teaching degree Gymnasium Russian (2009)  
 First state examination for the teaching degree Gymnasium Social Science (2009)  
 First state examination for the teaching degree Gymnasium Spanish Studies (2009)  
 First state examination for the teaching degree Gymnasium Science of Sport (2009)  
 First state examination for the teaching degree Gymnasium Music Education, Advanced Studies (2009)  
 Bachelor's degree (2 majors) English and American Studies (2009)  
 Bachelor's degree (2 majors) German Language and Literature (2013)  
 Bachelor's degree (1 major) Biochemistry (2015)  
 Bachelor's degree (1 major) Chemistry (2015)  
 Bachelor's degree (1 major) Geography (2015)  
 Bachelor's degree (1 major) Computer Science (2015)  
 Bachelor's degree (1 major) Food Chemistry (2015)  
 Bachelor's degree (1 major) Mathematics (2015)  
 Bachelor's degree (1 major) Musicology (2015)  
 Bachelor's degree (1 major) Physics (2015)  
 Bachelor's degree (1 major) Psychology (2015)  
 Bachelor's degree (1 major) Business Management and Economics (2015)  
 Bachelor's degree (1 major) Nanostructure Technology (2015)  
 Bachelor's degree (1 major) Biomedicine (2015)  
 Bachelor's degree (1 major) Music Education (2015)  
 Bachelor's degree (1 major) Computational Mathematics (2015)  
 Bachelor's degree (1 major) Political and Social Studies (2015)  
 Bachelor's degree (1 major) Functional Materials (2015)  
 Bachelor's degree (1 major) Academic Speech Therapy (2015)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Egyptology (2015)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2015)  
 Bachelor's degree (1 major, 1 minor) History (2015)  
 Bachelor's degree (1 major, 1 minor) Musicology (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy (2015)  
 Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2015)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy and Religion (2015)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2015)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2015)  
 Bachelor's degree (2 majors) Egyptology (2015)  
 Bachelor's degree (2 majors) Pedagogy (2015)  
 Bachelor's degree (2 majors) Protestant Theology (2015)  
 Bachelor's degree (2 majors) Musicology (2015)  
 Bachelor's degree (2 majors) Philosophy (2015)  
 Bachelor's degree (2 majors) Special Education (2015)  
 Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2015)

Bachelor's degree (2 majors) Latin Philology (2015)  
 Bachelor's degree (2 majors) Music Education (2015)  
 Bachelor's degree (2 majors) Philosophy and Religion (2015)  
 Bachelor's degree (2 majors) Theological Studies (2015)  
 Bachelor's degree (2 majors) Political and Social Studies (2015)  
 Bachelor's degree (2 majors) Russian Language and Culture (2015)  
 Bachelor's degree (2 majors) Greek Philology (2015)  
 Bachelor's degree (2 majors) European Ethnology (2015)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2015)  
 First state examination for the teaching degree Gymnasium English (2015)  
 First state examination for the teaching degree Gymnasium Biology (2015)  
 First state examination for the teaching degree Gymnasium Chemistry (2015)  
 First state examination for the teaching degree Gymnasium Geography (2015)  
 First state examination for the teaching degree Gymnasium French Studies (2015)  
 First state examination for the teaching degree Gymnasium German (2015)  
 First state examination for the teaching degree Gymnasium History (2015)  
 First state examination for the teaching degree Gymnasium Greek Philology (2015)  
 First state examination for the teaching degree Gymnasium Computer Science (2015)  
 First state examination for the teaching degree Gymnasium Italian Studies (2015)  
 First state examination for the teaching degree Gymnasium Catholic Theology (2015)  
 First state examination for the teaching degree Gymnasium Latin Philology (2015)  
 First state examination for the teaching degree Gymnasium Mathematics (2015)  
 First state examination for the teaching degree Gymnasium Physics (2015)  
 First state examination for the teaching degree Gymnasium Russian (2015)  
 First state examination for the teaching degree Gymnasium Social Science (2015)  
 First state examination for the teaching degree Gymnasium Spanish Studies (2015)  
 First state examination for the teaching degree Gymnasium Science of Sport (2015)  
 Bachelor's degree (2 majors) Geography (2015)  
 Bachelor's degree (2 majors) French Studies (2015)  
 Bachelor's degree (2 majors) History (2015)  
 Bachelor's degree (2 majors) Sport Science (Focus on health and Pedagogics in Movement) (2015)  
 Bachelor's degree (2 majors) German Language and Literature (2015)  
 Bachelor's degree (1 major) Mathematical Physics (2016)  
 First state examination for the teaching degree Gymnasium Music (2015)  
 First state examination for the teaching degree Gymnasium Music Education, Advanced Studies (2015)  
 Bachelor's degree (1 major, 1 minor) French Studies (2016)  
 Bachelor's degree (2 majors) French Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Italian Studies (2016)  
 Bachelor's degree (2 majors) Italian Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Spanish Studies (2016)  
 Bachelor's degree (2 majors) Spanish Studies (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Italian) (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Spanish) (2016)  
 Bachelor's degree (1 major) Romanic Languages (Italian/Spanish) (2016)  
 Bachelor's degree (1 major) Business Information Systems (2016)  
 First state examination for the teaching degree Gymnasium French Studies (2016)  
 First state examination for the teaching degree Gymnasium Italian Studies (2016)  
 First state examination for the teaching degree Gymnasium Spanish Studies (2016)  
 Bachelor's degree (1 major) Games Engineering (2016)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2016)  
 Bachelor's degree (2 majors) English and American Studies (2016)  
 First state examination for the teaching degree Gymnasium English (2016)  
 Bachelor's degree (1 major) Media Communication (2016)



Bachelor's degree (1 major) Food Chemistry (2016)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2016)  
 Bachelor's degree (1 major) Biology (2017)  
 Bachelor's degree (1 major, 1 minor) Geography (2017)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2017)  
 Bachelor's degree (1 major) Aerospace Computer Science (2017)  
 Bachelor's degree (1 major) Biochemistry (2017)  
 Bachelor's degree (1 major) Chemistry (2017)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2017)  
 Bachelor's degree (1 major) Econometrics (2017)  
 Bachelor's degree (1 major) Games Engineering (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 First state examination for the teaching degree Gymnasium Greek Philology (2018)  
 Bachelor's degree (1 major) Media Communication (2018)  
 Bachelor's degree (1 major) Biomedicine (2018)  
 Bachelor's degree (1 major) Human-Computer Systems (2018)  
 Bachelor's degree (2 majors) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2018)  
 Bachelor's degree (2 majors) Digital Humanities (2018)  
 First state examination for the teaching degree Gymnasium Physics (2018)  
 Bachelor's degree (1 major) Computer Science (2019)  
 First state examination for the teaching degree Gymnasium Mathematics (2019)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2019)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2019)  
 Bachelor's degree (1 major) Business Information Systems (2019)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2019)  
 Bachelor's degree (1 major) Business Management and Economics (2019)  
 Bachelor's degree (1 major) Modern China (2019)  
 Bachelor's degree (1 major) Food Chemistry (2019)  
 Bachelor's degree (1 major) Biomedicine (2020)  
 Bachelor's degree (1 major) Pedagogy (2020)  
 Bachelor's degree (1 major) Political and Social Studies (2020)  
 Bachelor's degree (1 major) Business Information Systems (2020)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) European Ethnology (2020)  
 Bachelor's degree (2 majors) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) Special Education (2020)  
 Bachelor's degree (1 major) Physics (2020)  
 Bachelor's degree (1 major) Nanostructure Technology (2020)  
 Bachelor's degree (1 major) Mathematical Physics (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2020)  
 First state examination for the teaching degree Gymnasium Physics (2020)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2020)  
 Bachelor's degree (2 majors) Pedagogy (2020)  
 First state examination for the teaching degree Gymnasium Political and Social Studies (2020)  
 Bachelor's degree (1 major) Psychology (2020)  
 Bachelor's degree (1 major) Biology (2021)  
 Magister Theologiae Catholic Theology (2021)  
 Bachelor's degree (2 majors) History (2021)

Bachelor's degree (1 major, 1 minor) History (2021)  
 First state examination for the teaching degree Gymnasium History (2021)  
 Bachelor's degree (1 major) Media Communication (2021)  
 Bachelor's degree (2 majors) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2021)  
 Bachelor's degree (2 majors) English and American Studies (2021)  
 First state examination for the teaching degree Gymnasium English (2021)  
 Bachelor's degree (1 major) Functional Materials (2021)  
 First state examination for the teaching degree Gymnasium Philosophy and Ethics (2021)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2021)  
 Bachelor's degree (1 major) Food Chemistry (2021)  
 Bachelor's degree (1 major) Quantum Technology (2021)  
 Bachelor's degree (2 majors) Special Education (2021)  
 Bachelor's degree (1 major) Business Information Systems (2021)  
 Bachelor's degree (1 major) Econometrics (2021)  
 Bachelor's degree (1 major) Business Management and Economics (2021)  
 Bachelor's degree (1 major) Human-Computer Systems (2022)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2022)  
 Bachelor's degree (1 major) Biochemistry (2022)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Econometrics (2022)  
 Bachelor's degree (1 major) Mathematical Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 First state examination for the teaching degree Gymnasium Philosophy and Ethics (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Archaeology (2022)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Studies (2022)  
 Bachelor's degree (1 major) Franco-German studies: language, culture, digital competence (2022)  
 First state examination for the teaching degree Gymnasium Russian (2023)  
 First state examination for the teaching degree Gymnasium Mathematics (2023)  
 First state examination for the teaching degree Gymnasium English (2023)  
 First state examination for the teaching degree Gymnasium Geography (2023)  
 Bachelor's degree (1 major) European Law (2023)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2023)  
 Bachelor's degree (2 majors) English and American Studies (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Bachelor's degree (1 major) Econometrics (2023)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) Special Education (2023)  
 Bachelor's degree (1 major) Business Management and Economics (2023)  
 Bachelor's degree (1 major) Geography (2023)  
 Bachelor's degree (2 majors) Geography (2023)  
 Bachelor's degree (1 major, 1 minor) Geography (2023)  
 Bachelor's degree (2 majors) European Ethnology/Empirical Cultural Studies (2023)  
 First state examination for the teaching degree Gymnasium German (2024)  
 Bachelor's degree (1 major) Mathematical Physics (2024)  
 Bachelor's degree (2 majors) German Language and Literature (2024)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2024)

Bachelor's degree (1 major) Music Education (2024)  
 Bachelor's degree (2 majors) Music Education (2024)  
 Bachelor's degree (1 major, 1 minor) Music Education (2024)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2024)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2024)  
 Bachelor's degree (2 majors) Digital Humanities (2024)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2024)  
 Bachelor's degree (1 major) Midwifery (2024)  
 Bachelor's degree (2 majors) Greek Philology (2024)  
 Bachelor's degree (2 majors) Latin Philology (2024)  
 First state examination for the teaching degree Gymnasium Latin Philology (2024)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Economathematics (2024)  
 Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 First state examination for the teaching degree Gymnasium English (2024)  
 First state examination for the teaching degree Gymnasium History (2024)  
 First state examination for the teaching degree Gymnasium Greek Philology (2024)  
 Bachelor's degree (1 major) Human-Computer-Interaction (2024)  
 Bachelor's degree (2 majors) Art Education (2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Bachelor's degree (1 major) Classics (2024)  
 Bachelor's degree (1 major) Diversity, Ethics and Religions (2024)  
 Bachelor's degree (1 major) Functional Materials (2025)  
 Bachelor's degree (1 major) (2025)  
 Bachelor's degree (1 major) Food Chemistry (2025)  
 Bachelor's degree (1 major, 1 minor) European Ethnology/Empiric Cultural Studies (2025)  
 Bachelor's degree (1 major) Pedagogy (2025)  
 Bachelor's degree (2 majors) Pedagogy (2025)  
 Bachelor's degree (1 major) Economathematics (2025)  
 Bachelor's degree (1 major) Academic Speech Therapy (2025)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
Laboratory Course Physics for Students of other Disciplines		11-PFNF-152-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		
Simple experiments in the fields of mechanics, vibration theory, thermodynamics, optics, X-rays, nuclear magnetic resonance atomic and nuclear physics, imaging methods.		
Intended learning outcomes		
The students have recognised and understood physical contexts on the basis of the implementation of own experiments. They can conduct simple experiments in the laboratory. They are able to identify and assess sources of errors in experiments. They are able to compile a protocol for experimental procedures. They have a basic understanding of physical phenomena and know the basic ideas and ways of functioning of different measuring and imaging methods as well as their applications, especially in the field of biomedicine.		
Courses (type, number of weekly contact hours, language — if other than German)		
P (4)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) practical assignment with oral test (approx. 15 minutes, during experiments) and b) written examination (approx. 90 minutes). Each experiment comprises preparation, performance and evaluation. Test as well as performance of experiments can each be repeated once.		
Allocation of places		
Only as part of pool of general transferable skills (ASQ): 10 places (lottery)		
Additional information		
according to § 2 para. 2 sentence 2 APOLmCh in conjunction with No. I 2nd letter d) and No. I 1st letter d) of annex 1 to the APOLmCh and No. 4 of annex 2 to the APOLmCh		
Workload		
90 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
Bachelor's degree (1 major) Biology (2011) Bachelor's degree (1 major) Chemistry (2010) Bachelor's degree (1 major) Psychology (2010) Bachelor's degree (1 major, 1 minor) Pedagogy (2013) Bachelor's degree (1 major, 1 minor) Political and Social Studies (2013) Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2008) Bachelor's degree (2 majors) Special Education (2009) Magister Theologiae Catholic Theology (2013) First state examination for the teaching degree Gymnasium English (2009)		

First state examination for the teaching degree Gymnasium Biology (2009)  
 First state examination for the teaching degree Gymnasium Chemistry (2009)  
 First state examination for the teaching degree Gymnasium Geography (2009)  
 First state examination for the teaching degree Gymnasium French Studies (2009)  
 First state examination for the teaching degree Gymnasium German (2009)  
 First state examination for the teaching degree Gymnasium History (2009)  
 First state examination for the teaching degree Gymnasium Greek Philology (2009)  
 First state examination for the teaching degree Gymnasium Computer Science (2009)  
 First state examination for the teaching degree Gymnasium Italian Studies (2009)  
 First state examination for the teaching degree Gymnasium Catholic Theology (2009)  
 First state examination for the teaching degree Gymnasium Latin Philology (2009)  
 First state examination for the teaching degree Gymnasium Mathematics (2012)  
 First state examination for the teaching degree Gymnasium Mathematics (2009)  
 First state examination for the teaching degree Gymnasium Music (2009)  
 First state examination for the teaching degree Gymnasium Physics (2009)  
 First state examination for the teaching degree Gymnasium Russian (2009)  
 First state examination for the teaching degree Gymnasium Social Science (2009)  
 First state examination for the teaching degree Gymnasium Spanish Studies (2009)  
 First state examination for the teaching degree Gymnasium Science of Sport (2009)  
 First state examination for the teaching degree Gymnasium Music Education, Advanced Studies (2009)  
 Bachelor's degree (2 majors) English and American Studies (2009)  
 Bachelor's degree (2 majors) German Language and Literature (2013)  
 Bachelor's degree (1 major) Biochemistry (2015)  
 Bachelor's degree (1 major) Chemistry (2015)  
 Bachelor's degree (1 major) Geography (2015)  
 Bachelor's degree (1 major) Computer Science (2015)  
 Bachelor's degree (1 major) Food Chemistry (2015)  
 Bachelor's degree (1 major) Mathematics (2015)  
 Bachelor's degree (1 major) Musicology (2015)  
 Bachelor's degree (1 major) Physics (2015)  
 Bachelor's degree (1 major) Psychology (2015)  
 Bachelor's degree (1 major) Business Management and Economics (2015)  
 Bachelor's degree (1 major) Nanostructure Technology (2015)  
 Bachelor's degree (1 major) Biomedicine (2015)  
 Bachelor's degree (1 major) Music Education (2015)  
 Bachelor's degree (1 major) Computational Mathematics (2015)  
 Bachelor's degree (1 major) Political and Social Studies (2015)  
 Bachelor's degree (1 major) Functional Materials (2015)  
 Bachelor's degree (1 major) Academic Speech Therapy (2015)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Egyptology (2015)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2015)  
 Bachelor's degree (1 major, 1 minor) History (2015)  
 Bachelor's degree (1 major, 1 minor) Musicology (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy (2015)  
 Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2015)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy and Religion (2015)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2015)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2015)  
 Bachelor's degree (2 majors) Egyptology (2015)



Bachelor's degree (2 majors) Pedagogy (2015)  
 Bachelor's degree (2 majors) Protestant Theology (2015)  
 Bachelor's degree (2 majors) Musicology (2015)  
 Bachelor's degree (2 majors) Philosophy (2015)  
 Bachelor's degree (2 majors) Special Education (2015)  
 Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2015)  
 Bachelor's degree (2 majors) Latin Philology (2015)  
 Bachelor's degree (2 majors) Music Education (2015)  
 Bachelor's degree (2 majors) Philosophy and Religion (2015)  
 Bachelor's degree (2 majors) Theological Studies (2015)  
 Bachelor's degree (2 majors) Political and Social Studies (2015)  
 Bachelor's degree (2 majors) Russian Language and Culture (2015)  
 Bachelor's degree (2 majors) Greek Philology (2015)  
 Bachelor's degree (2 majors) European Ethnology (2015)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2015)  
 First state examination for the teaching degree Gymnasium English (2015)  
 First state examination for the teaching degree Gymnasium Biology (2015)  
 First state examination for the teaching degree Gymnasium Chemistry (2015)  
 First state examination for the teaching degree Gymnasium Geography (2015)  
 First state examination for the teaching degree Gymnasium French Studies (2015)  
 First state examination for the teaching degree Gymnasium German (2015)  
 First state examination for the teaching degree Gymnasium History (2015)  
 First state examination for the teaching degree Gymnasium Greek Philology (2015)  
 First state examination for the teaching degree Gymnasium Computer Science (2015)  
 First state examination for the teaching degree Gymnasium Italian Studies (2015)  
 First state examination for the teaching degree Gymnasium Catholic Theology (2015)  
 First state examination for the teaching degree Gymnasium Latin Philology (2015)  
 First state examination for the teaching degree Gymnasium Mathematics (2015)  
 First state examination for the teaching degree Gymnasium Physics (2015)  
 First state examination for the teaching degree Gymnasium Russian (2015)  
 First state examination for the teaching degree Gymnasium Social Science (2015)  
 First state examination for the teaching degree Gymnasium Spanish Studies (2015)  
 First state examination for the teaching degree Gymnasium Science of Sport (2015)  
 Bachelor's degree (2 majors) Geography (2015)  
 Bachelor's degree (2 majors) French Studies (2015)  
 Bachelor's degree (2 majors) History (2015)  
 Bachelor's degree (2 majors) Sport Science (Focus on health and Pedagogics in Movement) (2015)  
 Bachelor's degree (2 majors) German Language and Literature (2015)  
 Bachelor's degree (1 major) Mathematical Physics (2016)  
 First state examination for the teaching degree Gymnasium Music (2015)  
 First state examination for the teaching degree Gymnasium Music Education, Advanced Studies (2015)  
 Bachelor's degree (1 major, 1 minor) French Studies (2016)  
 Bachelor's degree (2 majors) French Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Italian Studies (2016)  
 Bachelor's degree (2 majors) Italian Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Spanish Studies (2016)  
 Bachelor's degree (2 majors) Spanish Studies (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Italian) (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Spanish) (2016)  
 Bachelor's degree (1 major) Romanic Languages (Italian/Spanish) (2016)  
 Bachelor's degree (1 major) Business Information Systems (2016)  
 First state examination for the teaching degree Gymnasium French Studies (2016)  
 First state examination for the teaching degree Gymnasium Italian Studies (2016)

First state examination for the teaching degree Gymnasium Spanish Studies (2016)  
 Bachelor's degree (1 major) Games Engineering (2016)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2016)  
 Bachelor's degree (2 majors) English and American Studies (2016)  
 First state examination for the teaching degree Gymnasium English (2016)  
 Bachelor's degree (1 major) Media Communication (2016)  
 Bachelor's degree (1 major) Food Chemistry (2016)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2016)  
 Bachelor's degree (1 major) Biology (2017)  
 Bachelor's degree (1 major, 1 minor) Geography (2017)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2017)  
 Bachelor's degree (1 major) Aerospace Computer Science (2017)  
 Bachelor's degree (1 major) Biochemistry (2017)  
 Bachelor's degree (1 major) Chemistry (2017)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2017)  
 Bachelor's degree (1 major) Econometrics (2017)  
 Bachelor's degree (1 major) Games Engineering (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 First state examination for the teaching degree Gymnasium Greek Philology (2018)  
 Bachelor's degree (1 major) Media Communication (2018)  
 Bachelor's degree (1 major) Biomedicine (2018)  
 Bachelor's degree (1 major) Human-Computer Systems (2018)  
 Bachelor's degree (2 majors) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2018)  
 Bachelor's degree (2 majors) Digital Humanities (2018)  
 First state examination for the teaching degree Gymnasium Physics (2018)  
 Bachelor's degree (1 major) Computer Science (2019)  
 First state examination for the teaching degree Gymnasium Mathematics (2019)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2019)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2019)  
 Bachelor's degree (1 major) Business Information Systems (2019)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2019)  
 Bachelor's degree (1 major) Business Management and Economics (2019)  
 Bachelor's degree (1 major) Modern China (2019)  
 Bachelor's degree (1 major) Food Chemistry (2019)  
 Module studies (Bachelor) Orientierungsstudien (2020)  
 Bachelor's degree (1 major) Biomedicine (2020)  
 Bachelor's degree (1 major) Pedagogy (2020)  
 Bachelor's degree (1 major) Political and Social Studies (2020)  
 Bachelor's degree (1 major) Business Information Systems (2020)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) European Ethnology (2020)  
 Bachelor's degree (2 majors) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) Special Education (2020)  
 Bachelor's degree (1 major) Physics (2020)  
 Bachelor's degree (1 major) Nanostructure Technology (2020)  
 Bachelor's degree (1 major) Mathematical Physics (2020)  
 Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2020)  
 First state examination for the teaching degree Gymnasium Physics (2020)

Bachelor's degree (1 major, 1 minor) Pedagogy (2020)  
 Bachelor's degree (2 majors) Pedagogy (2020)  
 First state examination for the teaching degree Gymnasium Political and Social Studies (2020)  
 Bachelor's degree (1 major) Psychology (2020)  
 Bachelor's degree (1 major) Biology (2021)  
 Magister Theologiae Catholic Theology (2021)  
 Bachelor's degree (2 majors) History (2021)  
 Bachelor's degree (1 major, 1 minor) History (2021)  
 First state examination for the teaching degree Gymnasium History (2021)  
 Bachelor's degree (1 major) Media Communication (2021)  
 Bachelor's degree (2 majors) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2021)  
 Bachelor's degree (2 majors) English and American Studies (2021)  
 First state examination for the teaching degree Gymnasium English (2021)  
 Bachelor's degree (1 major) Functional Materials (2021)  
 First state examination for the teaching degree Gymnasium Philosophy and Ethics (2021)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2021)  
 Bachelor's degree (1 major) Food Chemistry (2021)  
 Bachelor's degree (1 major) Quantum Technology (2021)  
 Bachelor's degree (2 majors) Special Education (2021)  
 Bachelor's degree (1 major) Business Information Systems (2021)  
 Bachelor's degree (1 major) Economathematics (2021)  
 Bachelor's degree (1 major) Business Management and Economics (2021)  
 Bachelor's degree (1 major) Human-Computer Systems (2022)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2022)  
 Bachelor's degree (1 major) Biochemistry (2022)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Economathematics (2022)  
 Bachelor's degree (1 major) Mathematical Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 First state examination for the teaching degree Gymnasium Philosophy and Ethics (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Archaeology (2022)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Studies (2022)  
 Bachelor's degree (1 major) Franco-German studies: language, culture, digital competence (2022)  
 First state examination for the teaching degree Gymnasium Russian (2023)  
 First state examination for the teaching degree Gymnasium Mathematics (2023)  
 First state examination for the teaching degree Gymnasium English (2023)  
 First state examination for the teaching degree Gymnasium Geography (2023)  
 Bachelor's degree (1 major) European Law (2023)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2023)  
 Bachelor's degree (2 majors) English and American Studies (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Bachelor's degree (1 major) Economathematics (2023)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) Special Education (2023)  
 Bachelor's degree (1 major) Business Management and Economics (2023)  
 Bachelor's degree (1 major) Geography (2023)



Bachelor's degree (2 majors) Geography (2023)  
 Bachelor's degree (1 major, 1 minor) Geography (2023)  
 Bachelor's degree (2 majors) European Ethnology/Empiric Cultural Studies (2023)  
 First state examination for the teaching degree Gymnasium German (2024)  
 Bachelor's degree (1 major) Mathematical Physics (2024)  
 Bachelor's degree (2 majors) German Language and Literature (2024)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2024)  
 Bachelor's degree (1 major) Music Education (2024)  
 Bachelor's degree (2 majors) Music Education (2024)  
 Bachelor's degree (1 major, 1 minor) Music Education (2024)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2024)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2024)  
 Bachelor's degree (2 majors) Digital Humanities (2024)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2024)  
 Bachelor's degree (1 major) Midwifery (2024)  
 Bachelor's degree (2 majors) Greek Philology (2024)  
 Bachelor's degree (2 majors) Latin Philology (2024)  
 First state examination for the teaching degree Gymnasium Latin Philology (2024)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Econometrics (2024)  
 Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 First state examination for the teaching degree Gymnasium English (2024)  
 First state examination for the teaching degree Gymnasium History (2024)  
 First state examination for the teaching degree Gymnasium Greek Philology (2024)  
 Bachelor's degree (1 major) Human-Computer-Interaction (2024)  
 Bachelor's degree (2 majors) Art Education (2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Bachelor's degree (1 major) Classics (2024)  
 Bachelor's degree (1 major) Diversity, Ethics and Religions (2024)  
 Bachelor's degree (1 major) Functional Materials (2025)  
 Bachelor's degree (1 major) (2025)  
 Bachelor's degree (1 major) Food Chemistry (2025)  
 Bachelor's degree (1 major, 1 minor) European Ethnology/Empiric Cultural Studies (2025)  
 Bachelor's degree (1 major) Pedagogy (2025)  
 Bachelor's degree (2 majors) Pedagogy (2025)  
 Bachelor's degree (1 major) Econometrics (2025)  
 Bachelor's degree (1 major) Academic Speech Therapy (2025)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

## Economics

( ECTS credits)

Module title			Abbreviation
Organization			12-EBWL-G-242-m01
Module coordinator		Module offered by	
holder of the Chair for Human Resource Management and Organisation		Faculty of 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 lecture Organisation covers the basic methodological, empirical, and institutional concepts of management that are necessary for the further study of the subject. More specifically, it gives answers to the question why there are organisations. In addition, different goals, strategies, and structures of enterprises as well as their economic and societal environment are discussed. Finally, selected empirical findings from organisation research are presented together with the basic tool kit for empirical methods and approaches.			
Intended learning outcomes			
Students should be able to understand, discuss and apply basic theories, econometric techniques as well as empirical findings in organisation science.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) + T (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 minutes) creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
Teaching cycle: winter semester			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Module studies (Bachelor) Business Management and Economics (2019) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024) Bachelor's degree (1 major) Business Management and Economics (2024) Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024) Bachelor's degree (1 major) Digital Business & Data Science (2024) Bachelor's degree (1 major) Economathematics (2025) Master's degree (1 major) China Business and Economics (2025)			

Module title		Abbreviation
E-Business		12-Ebus-F-242-m01
Module coordinator		Module offered by
holder of the Chair of Information Systems Engineering		Faculty of 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		
E-business is a comprehensive, digital processing of business transactions between private and public enterprises as well as institutions and their clients on global public and private networks such as the internet. Precisely because euphoria for e-business has waned considerably in recent years, a lot of emphasis is now being placed on introducing such solutions in a user-oriented way. This lecture will first discuss the supporting economic theories and will then describe and analyse individual solutions such as e-procurement, e-shop, e-marketplace and e-community in detail.		
Intended learning outcomes		
The module provides students with knowledge about: (i) E-Procurement (ii) E-Shop (iii) E-Marketplace (iv) E-Community		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 60 minutes) or b) term paper (approx. 15 pages) or c) term paper (approx. 10 pages) and presentation (approx. 10 minutes); (weighted 2:1) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
Teaching cycle: summer semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
Module studies (Bachelor) Business Management and Economics (2019) Module studies (Bachelor) Orientierungsstudien (2020) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 92 / 150

Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Bachelor's degree (1 major) Econometrics (2025)  
 Master's degree (1 major) China Business and Economics (2025)

Module title		Abbreviation
Management & Digital Transformation		12-MDT-242-m01
Module coordinator		Module offered by
holder of the Junior Professorship of Applied Microeconomics, esp. Human-Machine Interaction		Faculty of 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 lecture Management and Digital Transformation offers a comprehensive introduction to the role of management in the context of the digital transformation of companies. Basic management concepts are taught from a (micro-)economic perspective and linked to the challenges, opportunities, and strategies of digital transformation. The lecture focuses on the organizational architecture and the distribution of decision-making competencies, on the use of machine learning for management decisions and the associated risks, as well as on strategic aspects, in particular the right decisions in the context of changing market conditions.		
Intended learning outcomes		
Students learn how the digital transformation affects organizations and their architecture. Problem-oriented thinking in strategic decision-making is encouraged to evaluate when and to what extent the application of new technologies can deliver value. They will become familiar with how incentives shape economic outcomes for individuals and firms. Furthermore, they will be able to apply basic concepts of game theory to strategic management decisions.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (2) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 60 minutes) or b) term paper (15 to 20 pages) or c) term paper (10 to 15 pages) and presentation (approx. 20 minutes); (weighted 2:1) or d) oral examination in groups of up to 3 candidates (approx. 15 minutes per candidate) Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
Teaching cycle: every year, winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		
Module studies (Bachelor) Business Management and Economics (2019) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 94 / 150

Bachelor's degree (1 major) Business Management and Economics (2024)  
Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)  
Bachelor's degree (1 major) Digital Business & Data Science (2024)  
Bachelor's degree (1 major) Econometrics (2025)

Module title		Abbreviation
Accounting		12-ExtUR-G-242-m01
Module coordinator		Module offered by
holder of the Chair of Business Management and Business Taxation		Faculty of 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	--
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes) creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
Teaching cycle: winter semester		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Module studies (Bachelor) Business Management and Economics (2019) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024) Bachelor's degree (1 major) Business Management and Economics (2024) Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024) Bachelor's degree (1 major) Digital Business & Data Science (2024) Bachelor's degree (1 major) Economathematics (2025) Master's degree (1 major) China Business and Economics (2025)		



Module title		Abbreviation
Managerial Accounting		12-IntUR-G-242-mo1
Module coordinator		Module offered by
holder of the Chair of Business Management, Controlling and Accounting		Faculty of 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"> <li>1. Managerial accounting and financial accounting</li> <li>2. Managerial accounting: basic terms</li> <li>3. Different types of costs</li> <li>4. Cost centre accounting based on total costs</li> <li>5. Job costing based on total costs</li> <li>6. Cost centre accounting and job costing based on direct/variable costs</li> <li>7. Budgeting and cost-variance analysis</li> <li>8. Cost-volume-profit analysis</li> <li>9. Cost information and operating decisions</li> </ol> <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> <p>(i) set out the responsibilities of the company's internal accounting and control;</p> <p>(ii) define the central concepts of internal enterprise computing restriction and control and assign case studies the terms;</p> <p>(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.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes) creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		

<b>Teaching cycle</b>
Teaching cycle: summer semester
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
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<b>Module appears in</b>
<p>Module studies (Bachelor) Business Management and Economics (2019)</p> <p>Module studies (Bachelor) Orientierungsstudien (2020)</p> <p>Bachelor's degree (1 major) Business Information Systems (2024)</p> <p>Bachelor's degree (1 major) Economathematics (2024)</p> <p>Bachelor's degree (1 major) Business Management and Economics (2024)</p> <p>Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)</p> <p>Bachelor's degree (1 major) Digital Business &amp; Data Science (2024)</p> <p>Bachelor's degree (1 major) Economathematics (2025)</p> <p>Master's degree (1 major) China Business and Economics (2025)</p>

Module title		Abbreviation
Operations Management		12-BPL-G-242-m01
Module coordinator		Module offered by
holder of the Chair of Business Management and Industrial Management		Faculty of 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	--
<b>Contents</b>		
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.		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2) Module taught in: German and/or English		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 60 minutes) or b) portfolio (approx. 20 hours) Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
Teaching cycle: winter semester		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
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<b>Module appears in</b>		
Module studies (Bachelor) Business Management and Economics (2019) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024) Bachelor's degree (1 major) Business Management and Economics (2024) Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024) Bachelor's degree (1 major) Digital Business & Data Science (2024) Bachelor's degree (1 major) Economathematics (2025) Master's degree (1 major) China Business and Economics (2025)		

Module title			Abbreviation
Investment and Finance			12-I&F-G-242-m01
Module coordinator		Module offered by	
holder of the Chair of Business Management and Corporate Finance		Faculty of 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"><li>1. Principles of financial mathematics</li><li>2. Fundamental concepts</li><li>3. Problems of investment and finance in one commodity world under certainty</li><li>4. Problems of investment and finance in one commodity world under uncertainty</li><li>5. Problems of investment and finance in many commodities world under uncertainty</li><li>6. Capital market and corporate financing in Germany</li></ol>			
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 (2) + T (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 minutes) creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
Teaching cycle: winter semester			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
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Module appears in			
Bachelor's degree (1 major) Business Information Systems (2024)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 100 / 150

Bachelor's degree (1 major) Economathematics (2024)  
 Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Bachelor's degree (1 major) Economathematics (2025)  
 Master's degree (1 major) China Business and Economics (2025)

Module title		Abbreviation
Marketing		12-Mark-G-242-mo1
Module coordinator		Module offered by
holder of the Chair of Business Administration and Marketing		Faculty of 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>Description</p> <p>In this module, students will acquire the theoretical foundations of market-oriented management.</p> <p>Content:</p> <p>With the stakeholder approach as a starting point, the basic design of market-oriented management will be explained and exemplified in the 5 classical steps: situation analysis, objectives, strategies, tools and controlling. The course will focus not only on the behavioural approaches of consumer behaviour but also on industrial purchasing behaviour. A case study introducing students to the fundamental principles of market research based on a conjoint analysis will provide students with deeper insights into the topic.</p> <p>Outline of syllabus:</p> <ol style="list-style-type: none"> <li>1. Marketing, entrepreneurship and business management</li> <li>2. Explanations of consumer behaviour</li> <li>3. Fundamentals of market research</li> <li>4. Strategic marketing; marketing tools</li> <li>5. Corporate social responsibility versus creating shared value</li> </ol> <p>Reading:</p> <p>Foscht, T. / Swoboda, B.: Käuferverhalten: Grundlagen -- Perspektiven -- Anwendungen, 4th revised and exp. ed., Wiesbaden 2011.</p> <p>Homburg, Ch.: Grundlagen des Marketingmanagements: Einführung in Strategie, Instrumente, Umsetzung und Unternehmensführung, 4th revised and exp. ed., Wiesbaden 2012.</p> <p>Homburg, Ch.: Grundlagen des Marketingmanagements: Einführung in Strategie, Instrumente, Umsetzung und Unternehmensführung, 3rd ed., Wiesbaden, 2012a.</p> <p>Kroeber-Riel, W. / Weinberg, P.: Konsumentenverhalten, 9th ed., Munich 2009.</p> <p>Meffert, H. / Burman, Ch / Kirchgeorg, M.: Marketing -- Grundlagen marktorientierter Unternehmensführung: Konzepte -- Instrumente -- Praxisbeispiele, 11th revised and exp. ed., Wiesbaden 2012.</p> <p>Meffert, H. / Burman, Ch / Becker, Ch.: Internationales Marketing-Management -- Ein markenorientierter Ansatz, 4th ed., Stuttgart 2010.</p> <p>Meyer, M.: Ökonomische Organisation der Industrie: Netzwerkarrangements zwischen Markt und Unternehmung, Wiesbaden 1995.</p> <p>Porter, M. E.: Wettbewerbsvorteile -- Spitzenleistungen erreichen und behaupten, 8th ed., Campus Frankfurt / New York 2014. (Original: Porter, M.: Competitive Advantage, New York 1985.)</p> <p>Simon, H. / Fassnacht, M.: Preismanagement, Strategie -- Analyse -- Entscheidung -- Umsetzung, 3rd ed., Wiesbaden 2009.</p>		
Intended learning outcomes		
The students have a basic understanding of business management and are able to classify the knowledge systematically. In addition, they can use the acquired knowledge solve and identify the conventional problem fields of business management.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2)		
Module taught in: German and/or English		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 102 / 150

<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)
written examination (approx. 60 minutes) Language of assessment: German and/or English creditable for bonus
<b>Allocation of places</b>
--
<b>Additional information</b>
--
<b>Workload</b>
150 h
<b>Teaching cycle</b>
Teaching cycle: summer semester
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)
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<b>Module appears in</b>
Module studies (Bachelor) Business Management and Economics (2019) Module studies (Bachelor) Orientierungsstudien (2020) Bachelor's degree (1 major) Business Information Systems (2024) Bachelor's degree (1 major) Economathematics (2024) Bachelor's degree (1 major) Business Management and Economics (2024) Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024) Bachelor's degree (1 major) Digital Business & Data Science (2024) Supplementary course Supplementary course Entrepreneurship into Action (ZENTRIA) (2025) Bachelor's degree (1 major) Economathematics (2025) Master's degree (1 major) China Business and Economics (2025)

Module title		Abbreviation
Public Policy		12-WiPo-G-242-m01
Module coordinator		Module offered by
holder of the Chair of Labour Economics		Faculty of 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 provides an introduction into public policy. Public policy studies the role of the government in the economy. It basically answers four questions:</p> <ul style="list-style-type: none"> <li>• When should the government intervene?</li> <li>• How might the government intervene?</li> <li>• What is the effect of those interventions?</li> <li>• Why do governments choose to intervene in the way that they do?</li> </ul> <p>The lecture will cover the following topics:</p> <ol style="list-style-type: none"> <li>1. Introduction into public economics/finance</li> <li>2. Theoretical toolkit</li> <li>3. Empirical toolkit</li> <li>4. Public goods</li> <li>5. Cost Benefit Analysis</li> </ol>		
Intended learning outcomes		
<p>The aim of the course is to provide students with an understanding of the public policy making process of the government and to endow them with the necessary skills to judge about and/or design public policies. Students will learn the core theoretical models of public economics as well as modern empirical methods of public finance. The focus will not lie on the theoretical details, but rather on the beauty of the different methods to provide answers to public policy questions.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2) Module taught in: German and/or English		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) written examination (approx. 60 minutes) or b) portfolio (approx. 20 hours) Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
Teaching cycle: winter semester		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
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Module appears in		



Bachelor's degree (1 major) Biology (2011)  
 Bachelor's degree (1 major) Chemistry (2010)  
 Bachelor's degree (1 major) Psychology (2010)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2013)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2013)  
 Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2008)  
 Bachelor's degree (2 majors) Special Education (2009)  
 Magister Theologiae Catholic Theology (2013)  
 Bachelor's degree (2 majors) English and American Studies (2009)  
 Bachelor's degree (2 majors) German Language and Literature (2013)  
 Bachelor's degree (1 major) Chemistry (2015)  
 Bachelor's degree (1 major) Geography (2015)  
 Bachelor's degree (1 major) Mathematics (2015)  
 Bachelor's degree (1 major) Musicology (2015)  
 Bachelor's degree (1 major) Physics (2015)  
 Bachelor's degree (1 major) Psychology (2015)  
 Bachelor's degree (1 major) Nanostructure Technology (2015)  
 Bachelor's degree (1 major) Music Education (2015)  
 Bachelor's degree (1 major) Computational Mathematics (2015)  
 Bachelor's degree (1 major) Political and Social Studies (2015)  
 Bachelor's degree (1 major) Functional Materials (2015)  
 Bachelor's degree (1 major) Academic Speech Therapy (2015)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Egyptology (2015)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2015)  
 Bachelor's degree (1 major, 1 minor) History (2015)  
 Bachelor's degree (1 major, 1 minor) Musicology (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy (2015)  
 Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2015)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2015)  
 Bachelor's degree (1 major, 1 minor) Philosophy and Religion (2015)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2015)  
 Bachelor's degree (1 major, 1 minor) Russian Language and Culture (2015)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2015)  
 Bachelor's degree (2 majors) Egyptology (2015)  
 Bachelor's degree (2 majors) Pedagogy (2015)  
 Bachelor's degree (2 majors) Protestant Theology (2015)  
 Bachelor's degree (2 majors) Musicology (2015)  
 Bachelor's degree (2 majors) Philosophy (2015)  
 Bachelor's degree (2 majors) Special Education (2015)  
 Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2015)  
 Bachelor's degree (2 majors) Latin Philology (2015)  
 Bachelor's degree (2 majors) Music Education (2015)  
 Bachelor's degree (2 majors) Philosophy and Religion (2015)  
 Bachelor's degree (2 majors) Theological Studies (2015)  
 Bachelor's degree (2 majors) Political and Social Studies (2015)  
 Bachelor's degree (2 majors) Russian Language and Culture (2015)  
 Bachelor's degree (2 majors) Greek Philology (2015)  
 Bachelor's degree (2 majors) European Ethnology (2015)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2015)  
 Bachelor's degree (2 majors) Geography (2015)  
 Bachelor's degree (2 majors) French Studies (2015)

Bachelor's degree (2 majors) History (2015)  
 Bachelor's degree (2 majors) Sport Science (Focus on health and Pedagogics in Movement) (2015)  
 Bachelor's degree (2 majors) German Language and Literature (2015)  
 Bachelor's degree (1 major) Mathematical Physics (2016)  
 Bachelor's degree (1 major, 1 minor) French Studies (2016)  
 Bachelor's degree (2 majors) French Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Italian Studies (2016)  
 Bachelor's degree (2 majors) Italian Studies (2016)  
 Bachelor's degree (1 major, 1 minor) Spanish Studies (2016)  
 Bachelor's degree (2 majors) Spanish Studies (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Italian) (2016)  
 Bachelor's degree (1 major) Romanic Languages (French/Spanish) (2016)  
 Bachelor's degree (1 major) Romanic Languages (Italian/Spanish) (2016)  
 Bachelor's degree (1 major) Games Engineering (2016)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2016)  
 Bachelor's degree (2 majors) English and American Studies (2016)  
 Bachelor's degree (1 major) Media Communication (2016)  
 Bachelor's degree (1 major) Food Chemistry (2016)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2016)  
 Bachelor's degree (1 major) Biology (2017)  
 Bachelor's degree (1 major, 1 minor) Geography (2017)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2017)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2017)  
 Bachelor's degree (1 major) Aerospace Computer Science (2017)  
 Bachelor's degree (1 major) Biochemistry (2017)  
 Bachelor's degree (1 major) Chemistry (2017)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2017)  
 Bachelor's degree (1 major) Games Engineering (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 Bachelor's degree (1 major) Media Communication (2018)  
 Bachelor's degree (1 major) Biomedicine (2018)  
 Bachelor's degree (1 major) Human-Computer Systems (2018)  
 Bachelor's degree (2 majors) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Classical Archaeology (2018)  
 Bachelor's degree (1 major, 1 minor) Digital Humanities (2018)  
 Bachelor's degree (2 majors) Digital Humanities (2018)  
 Bachelor's degree (1 major) Computer Science (2019)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2019)  
 Module studies (Bachelor) Business Management and Economics (2019)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2019)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2019)  
 Bachelor's degree (1 major) Modern China (2019)  
 Bachelor's degree (1 major) Biomedicine (2020)  
 Bachelor's degree (1 major) Pedagogy (2020)  
 Bachelor's degree (1 major) Political and Social Studies (2020)  
 Bachelor's degree (1 major, 1 minor) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) European Ethnology (2020)  
 Bachelor's degree (2 majors) Political and Social Studies (2020)  
 Bachelor's degree (2 majors) Special Education (2020)  
 Bachelor's degree (1 major) Physics (2020)  
 Bachelor's degree (1 major) Nanostructure Technology (2020)  
 Bachelor's degree (1 major) Mathematical Physics (2020)

Bachelor's degree (1 major) Aerospace Computer Science (2020)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2020)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2020)  
 Bachelor's degree (2 majors) Pedagogy (2020)  
 Bachelor's degree (1 major) Psychology (2020)  
 Bachelor's degree (1 major) Biology (2021)  
 Magister Theologiae Catholic Theology (2021)  
 Bachelor's degree (2 majors) History (2021)  
 Bachelor's degree (1 major, 1 minor) History (2021)  
 Bachelor's degree (1 major) Media Communication (2021)  
 Bachelor's degree (2 majors) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) Theological Studies (2021)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2021)  
 Bachelor's degree (2 majors) English and American Studies (2021)  
 Bachelor's degree (1 major) Functional Materials (2021)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (2 majors) Comparative Indo-European Linguistics (2021)  
 Bachelor's degree (1 major) Food Chemistry (2021)  
 Bachelor's degree (1 major) Quantum Technology (2021)  
 Bachelor's degree (2 majors) Special Education (2021)  
 Bachelor's degree (1 major) Human-Computer Systems (2022)  
 Bachelor's degree (1 major, 1 minor) Museology and material culture (2022)  
 Bachelor's degree (1 major) Biochemistry (2022)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Mathematical Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Archaeology (2022)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2022)  
 Bachelor's degree (2 majors) Ancient Near Eastern Studies (2022)  
 Bachelor's degree (1 major) Franco-German studies: language, culture, digital competence (2022)  
 Bachelor's degree (1 major) European Law (2023)  
 Bachelor's degree (1 major, 1 minor) English and American Studies (2023)  
 Bachelor's degree (2 majors) English and American Studies (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major, 1 minor) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) History of Medieval and Modern Art (2023)  
 Bachelor's degree (2 majors) Special Education (2023)  
 Bachelor's degree (1 major) Geography (2023)  
 Bachelor's degree (2 majors) Geography (2023)  
 Bachelor's degree (1 major, 1 minor) Geography (2023)  
 Bachelor's degree (2 majors) European Ethnology/Empiric Cultural Studies (2023)  
 Bachelor's degree (1 major) Mathematical Physics (2024)  
 Bachelor's degree (2 majors) German Language and Literature (2024)  
 Bachelor's degree (1 major, 1 minor) German Language and Literature (2024)  
 Bachelor's degree (1 major) Music Education (2024)  
 Bachelor's degree (2 majors) Music Education (2024)  
 Bachelor's degree (1 major, 1 minor) Music Education (2024)  
 Bachelor's degree (1 major) Indology/South Asian Studies (2024)  
 Bachelor's degree (2 majors) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Indology/South Asian Studies (2024)  
 Bachelor's degree (1 major, 1 minor) Ancient World (2024)  
 Bachelor's degree (2 majors) Digital Humanities (2024)

Bachelor's degree (1 major, 1 minor) Digital Humanities (2024)  
 Bachelor's degree (1 major) Midwifery (2024)  
 Bachelor's degree (2 majors) Greek Philology (2024)  
 Bachelor's degree (2 majors) Latin Philology (2024)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Econometrics (2024)  
 Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)  
 Bachelor's degree (1 major) Human-Computer-Interaction (2024)  
 Bachelor's degree (2 majors) Art Education (2024)  
 Bachelor's degree (1 major) Classics (2024)  
 Bachelor's degree (1 major) Diversity, Ethics and Religions (2024)  
 Bachelor's degree (1 major) Functional Materials (2025)  
 Bachelor's degree (1 major) (2025)  
 Bachelor's degree (1 major) Food Chemistry (2025)  
 Bachelor's degree (1 major, 1 minor) European Ethnology/Empirical Cultural Studies (2025)  
 Bachelor's degree (1 major) Pedagogy (2025)  
 Bachelor's degree (2 majors) Pedagogy (2025)  
 Bachelor's degree (1 major) Econometrics (2025)  
 Bachelor's degree (1 major) Academic Speech Therapy (2025)  
 Master's degree (1 major) China Business and Economics (2025)  
 Bachelor's degree (1 major, 1 minor) Pedagogy (2025)  
 Bachelor's degree (1 major) Games Engineering (2025)

Module title		Abbreviation
<b>Microeconomics: Markets and Competition</b>		12-Mik2-G-242-m01
Module coordinator		Module offered by
holder of the Chair of Industrial Economics		Faculty of 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	--
<b>Contents</b>		
<p>Outline of syllabus:</p> <ol style="list-style-type: none"> <li>1. Cost minimisation</li> <li>2. Profit maximisation and the supply function</li> <li>3. Short-run market equilibrium</li> <li>4. Long-run market equilibrium</li> <li>5. Government interventions</li> <li>6. Monopoly</li> <li>7. Pricing strategies with market power</li> <li>8. Introduction to game theory</li> <li>9. Strategic interaction and oligopoly</li> </ol>		
<b>Intended learning outcomes</b>		
<p>The aim of the course is to understand how markets work. We will investigate the behavior of a company in different market structures; namely perfectly competitive markets, monopoly markets and all forms in between, the so-called oligopoly markets. Ultimately, we are interested in whether the market results from a social point of view is desirable. Using our models, we will also try to analyze the consequences of different government interventions. The knowledge that students gain in this course will be in their future course of studies of benefits to them. In almost all business and economics lectures markets play a role. It also discussed in detail how economic actors make their decisions. Students will thus learn the important building blocks of economic thought. This knowledge will also be useful in the workplace and even in their private lives.</p>		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2)		
Module taught in: German and/or English		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes)		
Language of assessment: German and/or English		
creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
Teaching cycle: winter semester		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		

Bachelor's degree (1 major) Business Information Systems (2024)  
 Bachelor's degree (1 major) Economathematics (2024)  
 Bachelor's degree (1 major) Business Management and Economics (2024)  
 Bachelor's degree (1 major, 1 minor) Business Management and Economics (Minor, 2024)  
 Bachelor's degree (1 major) Digital Business & Data Science (2024)  
 Bachelor's degree (1 major) Economathematics (2025)  
 Master's degree (1 major) China Business and Economics (2025)

# Linguistics

( ECTS credits)



Module title			Abbreviation
Level One Module German Linguistics			o4-DtLABA-BM-SW-241-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	--	
Contents			
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.			
Intended learning outcomes			
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.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) + S (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 75 minutes)			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 43 I Nr. 2 b) § 63 I Nr. 2 b)			
Module appears in			
Module studies (Bachelor) Orientierungsstudien (2020) Module studies (Bachelor) German Language and Literature (2023) First state examination for the teaching degree Grundschule German (2024) First state examination for the teaching degree Gymnasium German (2024) First state examination for the teaching degree Realschule German (2024) First state examination for the teaching degree Mittelschule German (2024) Bachelor's degree (2 majors) German Language and Literature (2024) Bachelor's degree (1 major, 1 minor) German Language and Literature (2024)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 112 / 150



Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2024)  
Bachelor's degree (1 major, 1 minor) Digital Humanities (2024)  
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title			Abbreviation
Level Two Module Grammatical Structures of German			o4-DtLABA-AM-SW1-241-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	--	
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)			
V (1) + S (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 75 minutes)			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 43 I Nr. 2 b) § 63 I Nr. 2 b)			
Module appears in			
First state examination for the teaching degree Grundschule German (2024) First state examination for the teaching degree Gymnasium German (2024) First state examination for the teaching degree Realschule German (2024) First state examination for the teaching degree Mittelschule German (2024) Bachelor's degree (2 majors) German Language and Literature (2024) Bachelor's degree (1 major, 1 minor) German Language and Literature (2024) Bachelor's degree (1 major, 1 minor) German Language and Literature (Minor, 2024) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 114 / 150

## Biology

( ECTS credits)

Module title		Abbreviation
Evolution and the Animal Kingdom		07-1A1Tl-152-m01
Module coordinator		Module offered by
holder of the Professorship of Zoology at the Department of Electronmicroscopy		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. Regular attendance (minimum 80%) and successful completion of exercises (approx. 25 to 30 hours) are prerequisites for admission to assessment.
<b>Contents</b>		
<p>The lecture <i>Evolution</i> will acquaint students with fundamental concepts and mechanisms of evolutionary biology: the origins of diversity; natural and sexual selection; speciation; population genetics. It will provide students with an introduction to phylogenetic reconstruction and will thus enable them to develop an understanding of the system of plants and animals. During the exercise, students will complete exercises on mechanistic evolution and evolutionary history. The lecture <i>Tierreich (Animal Kingdom)</i> will discuss the diversity of animal organisms on the basis of the phyla of the animal kingdom focusing on phylogenetic criteria. It will address the ecological constraints that led to the development of different types of body plans with their different structures and functions. In this context, the lecture will also develop an awareness in students of how important a knowledge of the fundamental principles of zoology is for research and applications not only but in particular in biology and medicine. In the exercise, students will prepare and/or examine selected species and histological preparations and will thus become familiar with the functional and morphological characteristics of the major multicellular animal phyla. In this context, students will practise working with light microscopes and stereo microscopes and will acquire fundamental preparation skills. They will prepare drawings, documenting and interpreting what they have seen.</p>		
<b>Intended learning outcomes</b>		
Students will be familiar with the fundamental concepts and mechanisms of evolutionary biology and will know that these are key to understanding biological processes. They will have gained an overview of the diversity of animals on the basis of different types of body plans and will understand important structures in both a functional and an ecological context.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + Ü (3)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 minutes) creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 41 I Nr. 1 (4 ECTS credits) and § 41 I Nr. 4 (1 ECTS credits) § 61 I Nr. 1 (4 ECTS credits) and § 61 I Nr. 4 (1 ECTS credits)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 116 / 150

### Module appears in

Bachelor's degree (1 major) Biology (2015)  
 Bachelor's degree (1 major) Computer Science (2015)  
 Bachelor's degree (1 major) Mathematics (2015)  
 Bachelor's degree (1 major) Computational Mathematics (2015)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2015)  
 Bachelor's degree (1 major) Biology (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 Bachelor's degree (1 major) Computer Science (2019)  
 Bachelor's degree (1 major) Biology (2021)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2020)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2021)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title		Abbreviation
Genetics, Neurobiology, Behaviour		07-2A2GENV-152-m01
Module coordinator		Module offered by
Dean of Studies Biologie (Biology)		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. Regular attendance (minimum 80%) and successful completion of exercises (approx. 25 to 30 hours) are prerequisites for admission to assessment.
<b>Contents</b>		
Fundamental principles of genetics, neurobiology and behavioural biology.		
<b>Intended learning outcomes</b>		
Students will understand that there are molecular, cellular and system biological mechanisms and processes involved in animal behaviour and will be able to relate animal behaviour to the molecular and formal bases of inheritance.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (3)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 90 minutes) creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 61 I Nr. 2 (2 ECTS credits) § 61 I Nr. 3 (1 ECTS credits) § 61 I Nr. 4 (1 ECTS credits)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Biology (2015) Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2015) Bachelor's degree (1 major) Biology (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Biology (2019) Module studies (Bachelor) Orientierungsstudien (2020) Bachelor's degree (1 major) Biology (2021)		
Bachelor's with 1 major Computer Science (2025)		page 118 / 150

Bachelor's degree (1 major, 1 minor) Biology (Minor, 2020)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2021)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title			Abbreviation
Mathematical Biology and Biostatistics			07-M-BST-152-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)	
4	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
Fundamental principles of the most important mathematical and statistical methods in biology.			
Intended learning outcomes			
Students will have acquired fundamental skills in the evaluation of experiments, the interpretation of readings and numbers as well as the mathematical description of biological processes.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 60 minutes) creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
120 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Biochemistry (2015) Bachelor's degree (1 major) Biology (2015) Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2015) Bachelor's degree (1 major) Biology (2017) Bachelor's degree (1 major) Biochemistry (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Biology (2021) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2020) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2021) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Biochemistry (2022) Bachelor's degree (1 major) Biology (2022)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 120 / 150



Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
Bachelor's degree (1 major) Mathematics (2023)  
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title			Abbreviation
Plant and Animal Ecology			07-3A3OEKO-152-m01
Module coordinator		Module offered by	
Dean of Studies Biologie (Biology)		Faculty of Biology	
ECTS	Method of grading	Only after succ. compl. of module(s)	
6	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
This module will provide students with an overview of the interactions of plants and animals with their abiotic and biotic environments. The module will focus on the functional adaptation to environmental conditions as well as on the structure and dynamics of populations, communities and ecosystems. Students will be introduced to fundamental model concepts of ecology, will become familiar with examples of research findings and will acquire the fundamental knowledge necessary to develop an understanding of current ecological problems.			
Intended learning outcomes			
Students are familiar with the fundamental principles of research in the field of ecology and with the most important abiotic and biotic factors that influence the distribution and frequency of occurrence of organisms in their environment. In addition, they understand the scientific relevance ecology has to the assessment of environmental issues.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 90 minutes) creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
180 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
§ 61 I Nr. 4			
Module appears in			
Bachelor's degree (1 major) Biology (2015) Bachelor's degree (1 major) Geography (2015) Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major) Computational Mathematics (2015) Bachelor's degree (1 major, 1 minor) Biology (Minor, 2015) First state examination for the teaching degree Gymnasium Biology (2015) Bachelor's degree (1 major) Biology (2017) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 122 / 150

Bachelor's degree (1 major) Biology (2021)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2020)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2021)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 exchange program Biosciences (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Geography (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title		Abbreviation
Genes, Molecules, Technologies		07-3A3GEMT-152-m01
Module coordinator		Module offered by
Dean of Studies Biologie (Biology)		Faculty of Biology
ECTS	Method of grading	Only after succ. compl. of module(s)
6	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
Contents		
<p>The module <i>Gene, Moleküle, Technologien</i> (<i>Genes, Molecules, Technologies</i>) will include lectures on the following topics: The section <i>Spezielle Genetik</i> (<i>Special Genetics</i>) will build on <i>Einführung in die Genetik</i> (<i>Introduction to Genetics</i>) and will deepen the students' knowledge of topics from the following areas: structure and evolution of the eukaryotic genome, regulatory RNA, epigenetically and evolutionarily significant genetic mechanisms. The section will also focus on methods of gene expression profiling, reverse genetics and modern methods of gene function and gene sequence analysis. In the lecture <i>Einführung in die Bioinformatik</i> (<i>Introduction to Bioinformatics</i>), students will acquire an overview of major areas in the field of bioinformatics: protein sequence and protein domain analysis, phylogeny and evolution of sequences, protein structure, RNA/DNA sequences and structures, cellular networks (regulation, metabolism) and systems biology. During the section <i>Einführung in die Biotechnologie</i> (<i>Introduction to Biotechnology</i>), students will acquire an overview of the following topics: history of biotechnology, DNA and RNA technologies, recombinant antibodies, molecular diagnostics, nanobiotechnology, biomaterials, bioprocess engineering, microbial biotechnology, transgenic animals and plants, microfluidics. The lecture <i>Einführung in die Pharmakokinetik</i> (<i>Introduction to Pharmacokinetics</i>) will provide students with an overview of the rational development of drugs and active agents. The module component will discuss an important aspect for biologists in more detail: the optimisation of the pharmacokinetics of small molecules and proteins. Pharmacokinetics describes the uptake, distribution, metabolism and elimination of a drug or xenobiotic in an organism.</p>		
Intended learning outcomes		
<p>Students possess an advanced knowledge on genome evolution and the regulation of gene expression and are familiar with current methods in genetics as well as methods for the analysis of DNA and protein databases. They have acquired an overview of both traditional and modern methods in biotechnology and are familiar with fundamental topics in biotechnology. Students have acquired an overview of the fundamental principles of the development and review of active agents in research, clinical practice and the pharmaceutical industry. They are familiar with methods and technologies in biology and are able to evaluate potential applications of these in research and industry.</p>		
Courses (type, number of weekly contact hours, language — if other than German)		
V (4)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 90 minutes) creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
180 h		
Teaching cycle		
--		

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

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**Module appears in**

Bachelor's degree (1 major) Biology (2015)  
 Bachelor's degree (1 major) Computer Science (2015)  
 Bachelor's degree (1 major) Mathematics (2015)  
 Bachelor's degree (1 major) Computational Mathematics (2015)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2015)  
 Bachelor's degree (1 major) Biology (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 Bachelor's degree (1 major) Computer Science (2019)  
 Bachelor's degree (1 major) Biology (2021)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2020)  
 Bachelor's degree (1 major, 1 minor) Biology (Minor, 2021)  
 Bachelor's degree (1 major) Biology (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 exchange program Biosciences (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

## Law

( ECTS credits)

Module title			Abbreviation
Commercial and Business Law for Economics and Management			o2-G&Hre-G-212-mo1
Module coordinator		Module offered by	
Dean of the Faculty of Law		Faculty of Law	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
German contents available but not translated yet.			
Dieses Modul bietet eine Einführung in das deutsche und europäische Gesellschafts- und Handelsrecht.			
Intended learning outcomes			
German intended learning outcomes available but not translated yet.			
Der/Die Studierende verfügt über Kenntnisse des Gesellschafts- und Handelsrechts, insbesondere über Gesellschaftsformen, Vertretungsmacht, Haftung, Gründung und Auflösungen von Gesellschaften sowie über Grundlagen des Rechts der Handelsgeschäfte und der Handelsgesellschaften.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (3) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 120 minutes)			
Assessment offered: Usually once a year, summer semester			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Business Management and Economics (2021)			
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)			
exchange program Business Management and Economics (2022)			
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)			
Bachelor's degree (1 major) Business Management and Economics (2023)			
Bachelor's degree (1 major) Business Management and Economics (2024)			
Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)			

Module title			Abbreviation
Civil Law for Economics and Management			o2-EReWi-G-212-mo1
Module coordinator		Module offered by	
Dean of the Faculty of Law		Faculty of Law	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
German contents available but not translated yet.			
Dieses Modul bietet eine Einführung in die Rechtswissenschaft. Behandelt wird das Zustandekommen von Ge- setzen, Arten von Gesetzen, Organisation des Gerichtswesens, Rechtsquellenkunde, Internationales Recht (Euro- pa, UNO), die deutsche Rechtsordnung (Privatrecht, Öffentliches Recht, Strafrecht).			
Intended learning outcomes			
German intended learning outcomes available but not translated yet.			
Der/Die Studierende verfügt über Kenntnisse der nationalen und internationalen Rechtsordnung, des Zustande- kommens und Inhalts sowie der Auflösung und Folgen von Verträgen, des Zustandekommens von Gesetzen, der Struktur der Rechtsordnungen.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (3) + Ü (2)			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 120 minutes)			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Business Management and Economics (2021)			
Bachelor's degree (1 major) Business Management and Economics (2023)			
Bachelor's degree (1 major) Business Management and Economics (2024)			



# Geography

( ECTS credits)

Module title		Abbreviation
Introduction to Geographical Remote Sensing		04-Geo-FERNE-152-m01
Module coordinator		Module offered by
holder of the Professorship of Remote Sensing		Institute of Geography and Geology
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	undergraduate	--
<b>Contents</b>		
The lecture gives an overview of the principles of remote sensing, that are: theoretical basics, history of remote sensing / physical principles (energy and radiation, interactions radiation - atmosphere, interactions radiation - surfaces, objects under investigation: soils, vegetation, water) / thermal remote sensing: radiation laws, radiant temperature, emissivity / detectors: characterisation of remote sensing data, platforms and sensors (passive and active systems, e.g. hyperspectral and LiDAR) / radar remote sensing / radar interferometry / basics for remote sensing parameters (land, atmosphere, oceans).		
<b>Intended learning outcomes</b>		
The students describe basics of earth observation. They outline and explain the radiation path through the atmosphere to the object under investigation and back to the sensor. They emphasise essential characteristics of remote sensing data, sensors and platforms.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
V (2) + T (2) Module taught in: German and/or English		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 45 minutes) Language of assessment: German and/or English creditable for bonus		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 66 I Nr. 2		
<b>Module appears in</b>		
Bachelor's degree (1 major) Geography (2015) Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2015) Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (2015) Bachelor's degree (1 major, 1 minor) Pre- and Protohistoric Archaeology (Minor, 2015) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2015) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2015) Bachelor's degree (2 majors) Pre- and Protohistoric Archaeology (2015)		
Bachelor's with 1 major Computer Science (2025)	JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 130 / 150

First state examination for the teaching degree Gymnasium Geography (2015)  
 Bachelor's degree (2 majors) Geography (2015)  
 Bachelor's degree (1 major, 1 minor) Geography (2017)  
 Bachelor's degree (1 major) Computer Science (2017)  
 Bachelor's degree (1 major) Computer Science (2019)  
 Module studies (Bachelor) Geography (2020)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 First state examination for the teaching degree Gymnasium Geography (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Geography (2023)  
 Bachelor's degree (2 majors) Geography (2023)  
 Bachelor's degree (1 major, 1 minor) Geography (Minor, 2023)  
 Bachelor's degree (1 major, 1 minor) Geography (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

Module title			Abbreviation
Applications of Remote Sensing in Geography			04-Geo-FERNA-152-m01
Module coordinator		Module offered by	
holder of the Professorship of Remote Sensing		Institute of Geography and Geology	
ECTS	Method of grading	Only after succ. compl. of module(s)	
5	numerical grade	--	
Duration	Module level	Other prerequisites	
1 semester	undergraduate	--	
Contents			
The lecture imparts basic knowledge about the analysis of remote sensing data for geographical questions. First, fundamental understanding of remotely sensed data as geoinformation and later geoinformation in general (geographical data, metadata, spatial overlaying of geodata, geographical information systems) is given. Following topics are analogue, visual image interpretation, digital image processing (calibration, transformation, filter) and atmospheric correction. A focus lies on the digital remote sensing based mapping, i.e. spectral analysis, classification and change detection. Furthermore, basics in modelling of remote sensing parameters is conveyed.			
Intended learning outcomes			
The students explain applications of earth observation and remote sensing. They explain geographical data and reflect their essential characteristics. They summarise fundamental aspects of (digital) image processing and assess different methodological approaches for the evaluation of remote sensing data for geographical questions.			
Courses (type, number of weekly contact hours, language — if other than German)			
V (2) + T (2) Module taught in: German and/or English			
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)			
written examination (approx. 45 minutes) Language of assessment: German and/or English creditable for bonus			
Allocation of places			
--			
Additional information			
--			
Workload			
150 h			
Teaching cycle			
--			
Referred to in LPO I (examination regulations for teaching-degree programmes)			
--			
Module appears in			
Bachelor's degree (1 major) Geography (2015) Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Mathematics (2015) Bachelor's degree (1 major, 1 minor) Geography (Minor, 2015) Bachelor's degree (1 major, 1 minor) Geography (Focus Physical Geography) (2015) Bachelor's degree (1 major, 1 minor) Geography (Focus Human Geography) (2015) Bachelor's degree (2 majors) Geography (2015) Bachelor's degree (1 major, 1 minor) Geography (2017) Bachelor's degree (1 major) Computer Science (2017)			
Bachelor's with 1 major Computer Science (2025)		JMU Würzburg • generated 19-Apr-2025 • exam. reg. data record Bachelor (180 ECTS) Informatik - 2025	page 132 / 150

Bachelor's degree (1 major) Computer Science (2019)  
 Module studies (Bachelor) Geography (2020)  
 Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023)  
 Bachelor's degree (1 major) Mathematics (2023)  
 Bachelor's degree (1 major) Geography (2023)  
 Bachelor's degree (2 majors) Geography (2023)  
 Bachelor's degree (1 major, 1 minor) Geography (Minor, 2023)  
 Bachelor's degree (1 major, 1 minor) Geography (2023)  
 Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)

# Medicine

( ECTS credits)

Module title		Abbreviation
Practical Course in medical terminology		03-M-MT-152-m01
Module coordinator		Module offered by
Institute for the History of Medicine		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
5	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	unknown	--
<b>Contents</b>		
No information on contents available.		
<b>Intended learning outcomes</b>		
No information on intended learning outcomes available.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
P (o)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written examination (approx. 60 to 90 minutes)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		

Module title		Abbreviation
Internal Medicine		03-M-IM-152-m01
Module coordinator		Module offered by
unknown		Faculty of Medicine
ECTS	Method of grading	Only after succ. compl. of module(s)
5	numerical grade	--
Duration	Module level	Other prerequisites
1 semester	unknown	--
Contents		
No information on contents available.		
Intended learning outcomes		
No information on intended learning outcomes available.		
Courses (type, number of weekly contact hours, language — if other than German)		
V (o)		
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 examination (one candidate each: approx. 15 minutes, or groups of up to 3 candidates: approx. 10 minutes per candidate) Assessment will usually have reference to one of the sub-specialities of internal medicine, e. g. cardiology, pulmonology, nephrology, endocrinology, oncology, gastroenterology, rheumatology, infectious disease.		
Allocation of places		
--		
Additional information		
--		
Workload		
150 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019)		



## Key Skills Area

(20 ECTS credits)

## General Key Skills

(5 ECTS credits)

In addition to the modules listed below, students may also take modules offered by JMU as part of the pool of general transferable skills (ASQ).

## General Key Skills (subject-specific)

( ECTS credits)

Module title		Abbreviation
Tutor activity 1		10-I-TUT1-152-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	(not) successfully completed	--
Duration	Module level	Other prerequisites
1-2 semester	undergraduate	--
<b>Contents</b>		
Tutoring activities in the area of computer science.		
<b>Intended learning outcomes</b>		
Imparting knowledge and skills to students of computer science.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
T (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Wrap-up report on tutoring activities (5 to 10 pages)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
60 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 2 f)		
§ 22 II Nr. 3 f)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) First state examination for the teaching degree Realschule Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		

Module title		Abbreviation
Tutor activity 2		10-I-TUT2-152-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	(not) successfully completed	--
Duration	Module level	Other prerequisites
1-2 semester	undergraduate	--
<b>Contents</b>		
Tutoring activities in the area of computer science.		
<b>Intended learning outcomes</b>		
Imparting knowledge and skills to students of computer science.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
T (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Wrap-up report on tutoring activities (5 to 10 pages)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
60 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 2 f)		
§ 22 II Nr. 3 f)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) First state examination for the teaching degree Realschule Computer Science (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		

Module title		Abbreviation
Tutor activity 3		10-I-TUT3-152-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	(not) successfully completed	--
Duration	Module level	Other prerequisites
1-2 semester	undergraduate	--
<b>Contents</b>		
Tutoring activities in the area of computer science.		
<b>Intended learning outcomes</b>		
Imparting knowledge and skills to students of computer science.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
T (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Wrap-up report on tutoring activities (5 to 10 pages)		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
60 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Bachelor's degree (1 major) Computer Science und Sustainability (2021) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2022) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2023) Bachelor's degree (1 major) Artificial Intelligence and Data Science (2024)		

## Subject-specific Key Skills

(15 ECTS credits)

Module title		Abbreviation
Seminar - Selected Topics in Computer Science 1		10-I-SEM1-152-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	--
<b>Contents</b>		
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).		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
written elaboration (approx. 10 to 15 pages) and presentation (approx. 30 to 45 minutes) with subsequent discussion on a topic from the field of computer science Language of assessment: German and/or English		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Business Information Systems (2015) First state examination for the teaching degree Gymnasium Computer Science (2015) Bachelor's degree (1 major) Business Information Systems (2016) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2016) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Bachelor's degree (1 major) Business Information Systems (2019) Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2020) Bachelor's degree (1 major) Business Information Systems (2020)		
Bachelor's with 1 major Computer Science (2025)		page 144 / 150



Bachelor's degree (1 major) Computer Science und Sustainability (2021)  
 Bachelor's degree (1 major) Business Information Systems (2021)  
 Bachelor's degree (1 major) Business Information Systems (2023)  
 Bachelor's degree (1 major) Business Information Systems (2024)  
 Master's teaching degree Gymnasium MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)  
 Supplementary course MINT Teacher Education PLUS, Elite Network Bavaria (ENB) (2025)

Module title		Abbreviation
<b>Seminar - Selected Topics in Computer Science 2</b>		10-I-SEM2-152-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	--
<b>Contents</b>		
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).		
<b>Intended learning outcomes</b>		
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.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
S (2)		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Wrap-up report on tutoring activities (5 to 10 pages) Language of assessment: German and/or English		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
--		
<b>Workload</b>		
150 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Business Information Systems (2015) Bachelor's degree (1 major) Business Information Systems (2016) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019) Module studies (Bachelor) Computer Science (2019) Bachelor's degree (1 major) Business Information Systems (2019) Bachelor's degree (1 major) Business Information Systems (2020) Bachelor's degree (1 major) Business Information Systems (2021) Bachelor's degree (1 major) Business Information Systems (2023) Bachelor's degree (1 major) Business Information Systems (2024)		

Module title		Abbreviation
Applied Statistics and Visualization		10-I-ASV-252-m01
Module coordinator		Module offered by
--		Institute of Computer Science
ECTS	Method of grading	Only after succ. compl. of module(s)
3	(not) successfully completed	--
Duration	Module level	Other prerequisites
1 semester	--	--
Contents		
--		
Intended learning outcomes		
--		
Courses (type, number of weekly contact hours, language — if other than German)		
V (1) + P (2)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
a) Portfolio (Workload approx. 75 h) or b) Written exam (approx. 60-75 minutes) If announced by the lecturer at the beginning of the course, the written examination may be replaced by an oral examination of one candidate each (approx. 20 minutes) or an oral examination in groups of 2 candidates (approx. 15 minutes per candidate). Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
90 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
--		
Module appears in		
keinem Studiengang zugeordnet		

Module title		Abbreviation
Project Presentation		10-I-PV-252-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 of a project developed by the student (e. g. Bachelor's thesis, software project) analogous to a presentation for laypersons with a knowledge of computer science at a trade fair. The project, which may also be work-in-progress, is presented with the help of a poster, a short talk and optionally a live demonstration.		
Intended learning outcomes		
The students are able to present a project they developed and to create the required media.		
Courses (type, number of weekly contact hours, language — if other than German)		
S (3)		
Method of assessment (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Presentation of a self-developed project analogous to a trade fair presentation for computer science laypersons with discussion (approx. 10-15 minutes) Language of assessment: German and/or English creditable for bonus		
Allocation of places		
--		
Additional information		
--		
Workload		
60 h		
Teaching cycle		
--		
Referred to in LPO I (examination regulations for teaching-degree programmes)		
§ 22 II Nr. 3 b)		
Module appears in		
keinem Studiengang zugeordnet		

# Thesis

(10 ECTS credits)

Module title		Abbreviation
Bachelor's Thesis Informatics		10-I-BA-152-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	--
<b>Contents</b>		
Researching and writing on a defined problem within a given time frame and adhering to the principles of good scientific practice.		
<b>Intended learning outcomes</b>		
The students are able to research and write on a defined problem, adhering to the principles of good scientific practice.		
<b>Courses</b> (type, number of weekly contact hours, language — if other than German)		
No courses assigned to module		
<b>Method of assessment</b> (type, scope, language — if other than German, examination offered — if not every semester, information on whether module is creditable for bonus)		
Bachelor's thesis (approx. 50 to 100 pages) Language of assessment: German and/or English		
<b>Allocation of places</b>		
--		
<b>Additional information</b>		
Time to complete: 10 weeks.		
<b>Workload</b>		
300 h		
<b>Teaching cycle</b>		
--		
<b>Referred to in LPO I</b> (examination regulations for teaching-degree programmes)		
--		
<b>Module appears in</b>		
Bachelor's degree (1 major) Computer Science (2015) Bachelor's degree (1 major) Computer Science (2017) Bachelor's degree (1 major) Computer Science (2019)		